

FIG.1

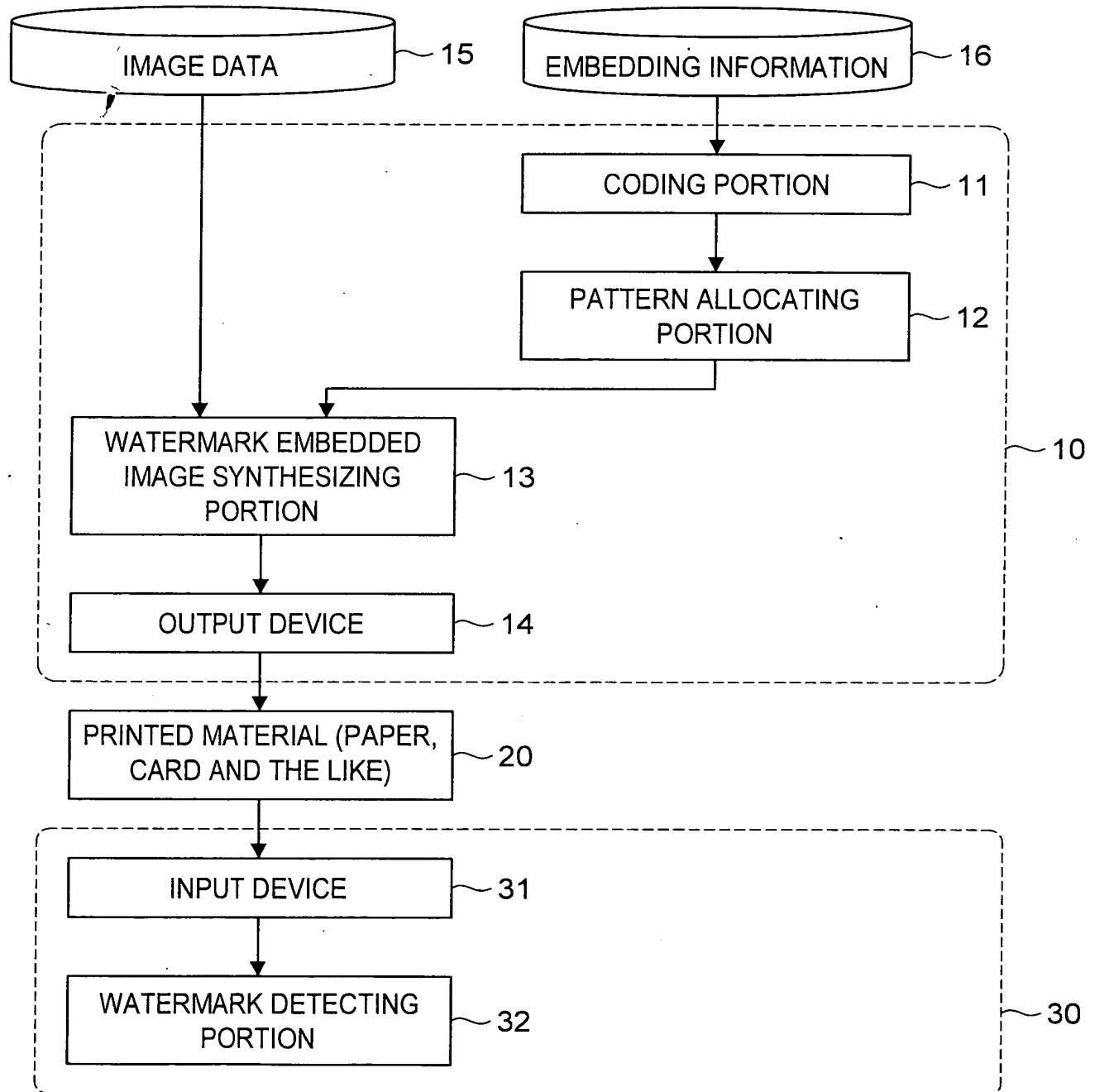


FIG.2

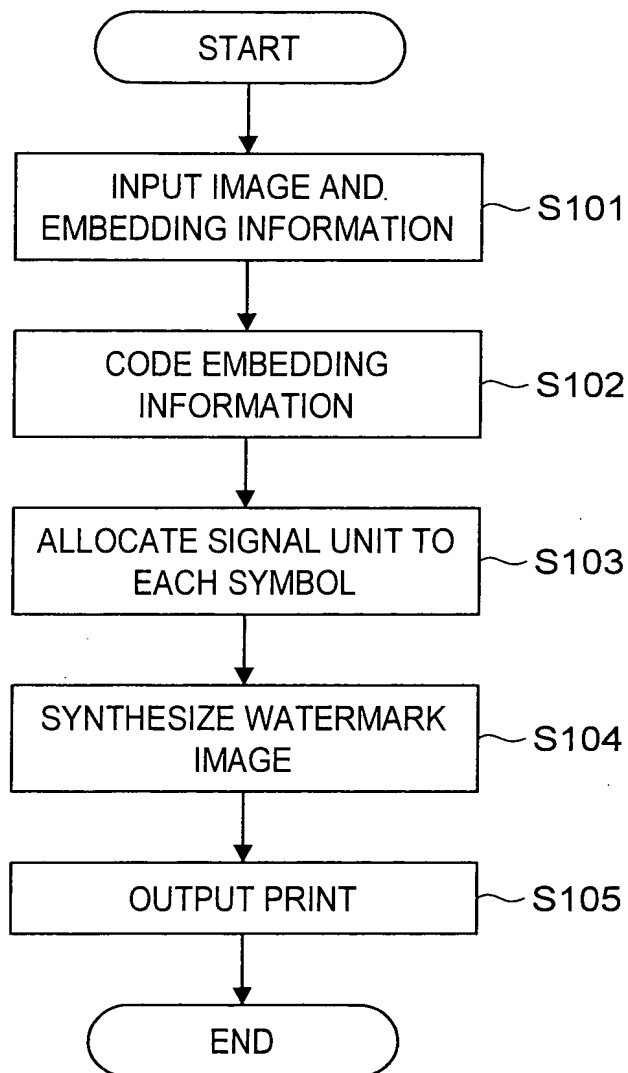
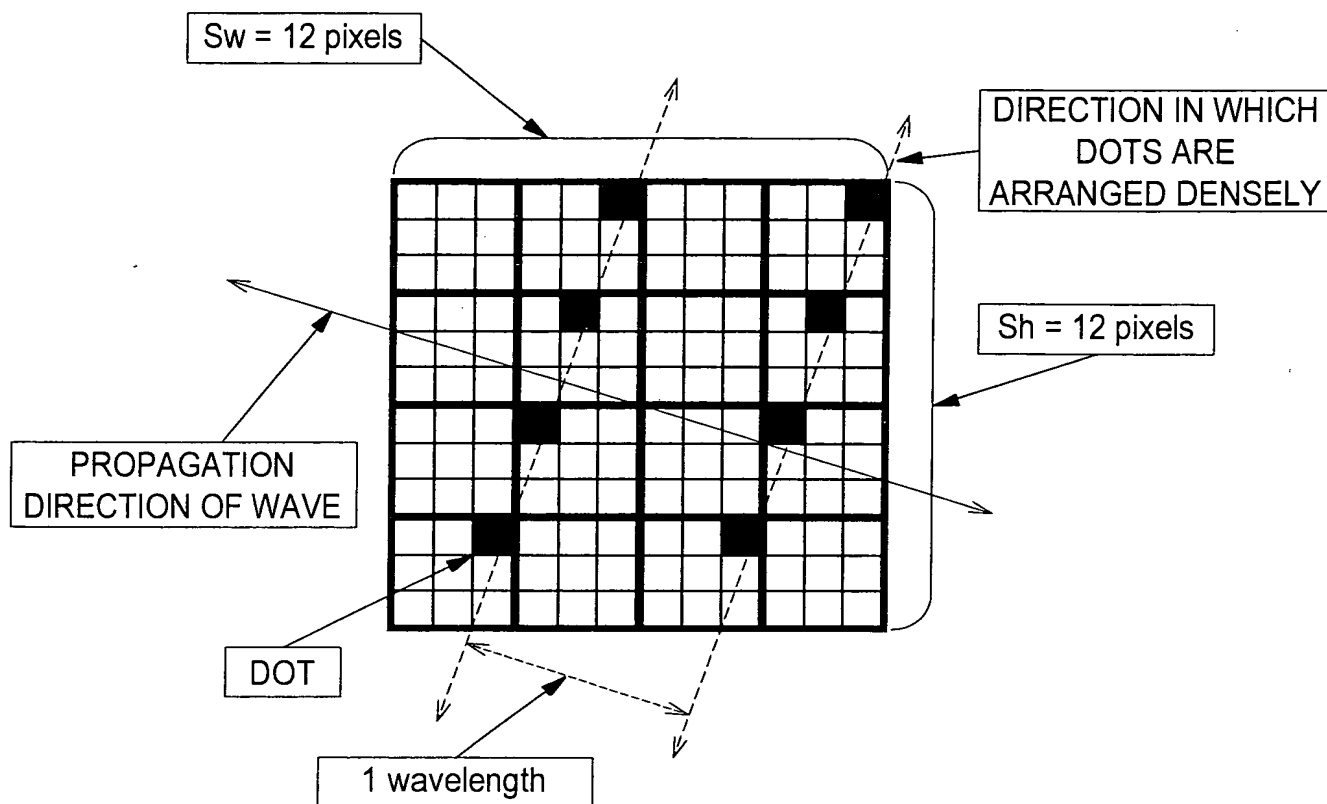
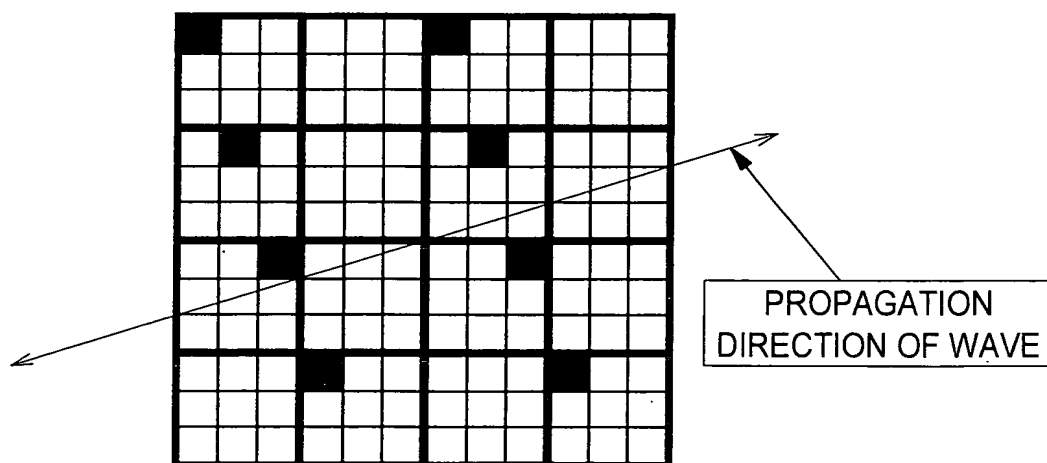


FIG.3

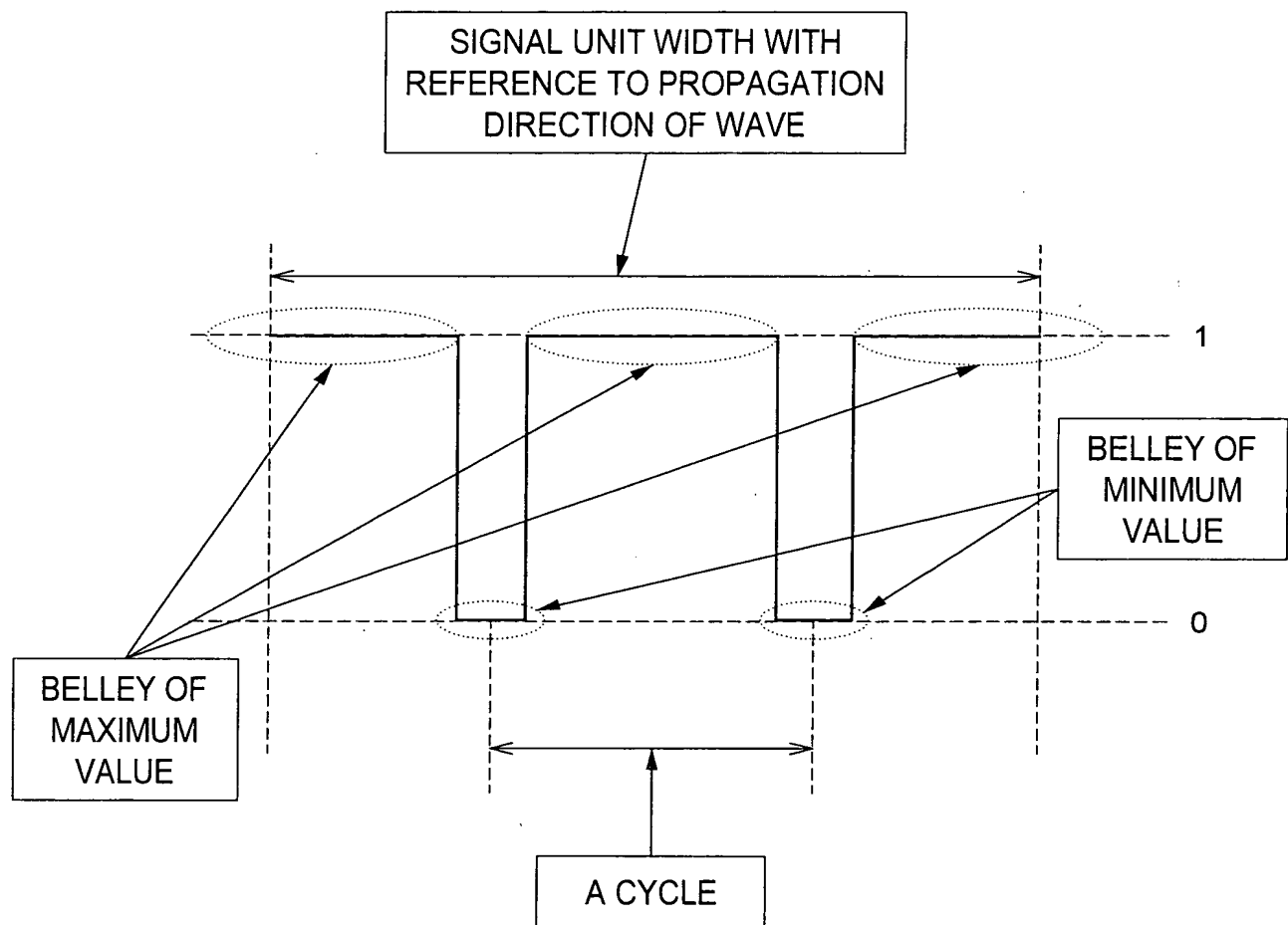


(1) UNIT A



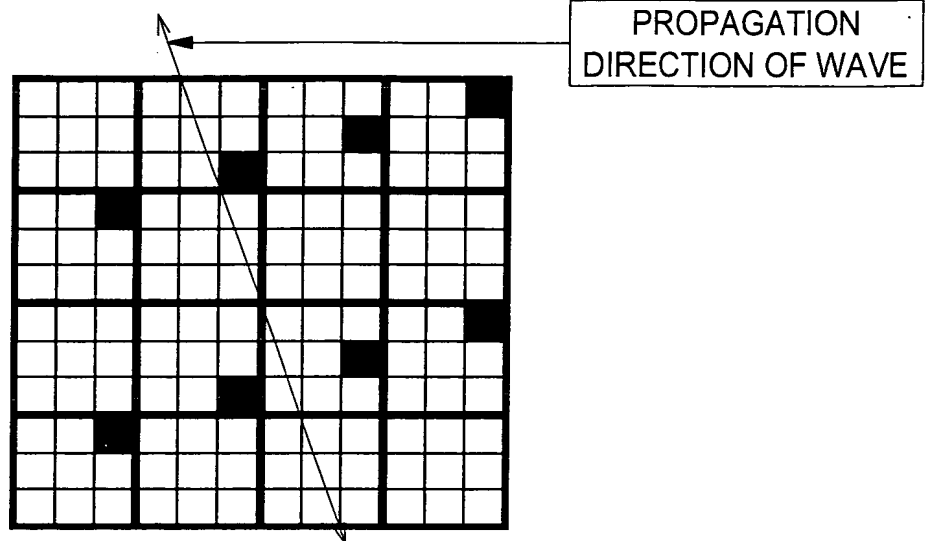
(2) UNIT B

FIG.4

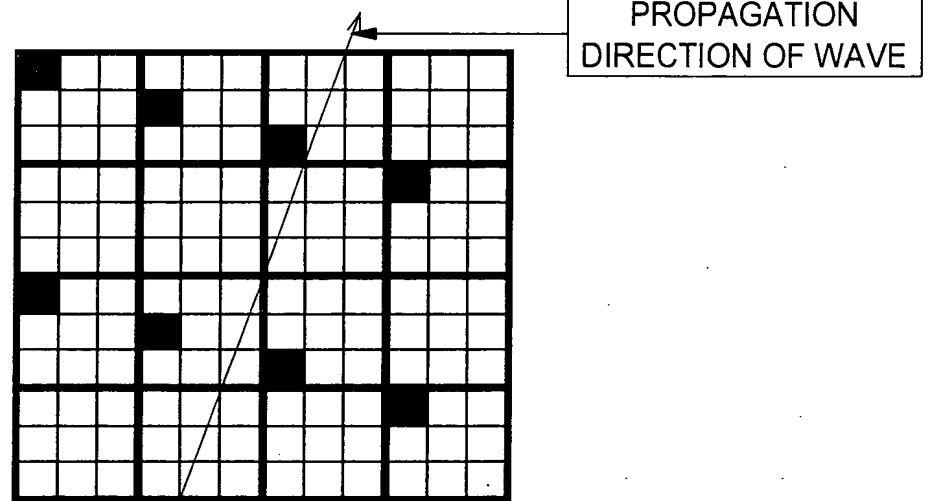


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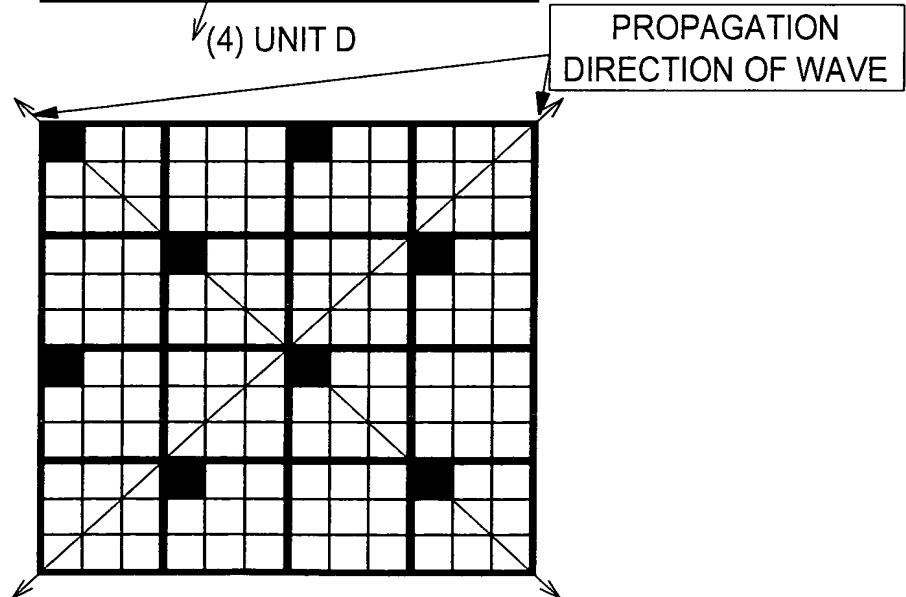
FIG.5



(3) UNIT C



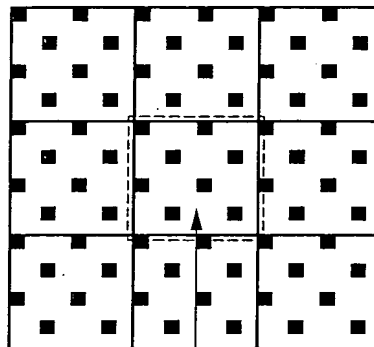
(4) UNIT D



(5) UNIT E

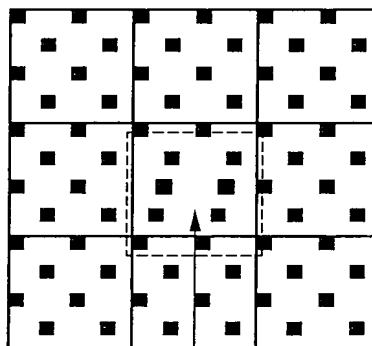
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FIG.6



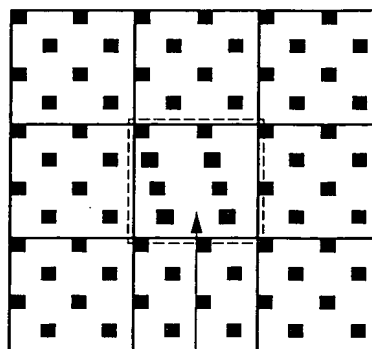
UNIT E

(1)



UNIT A

(2)

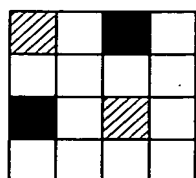
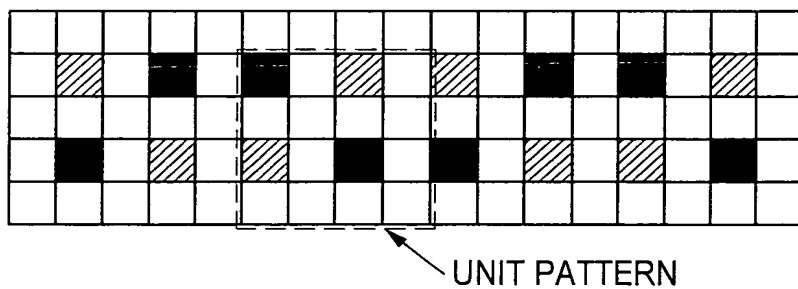
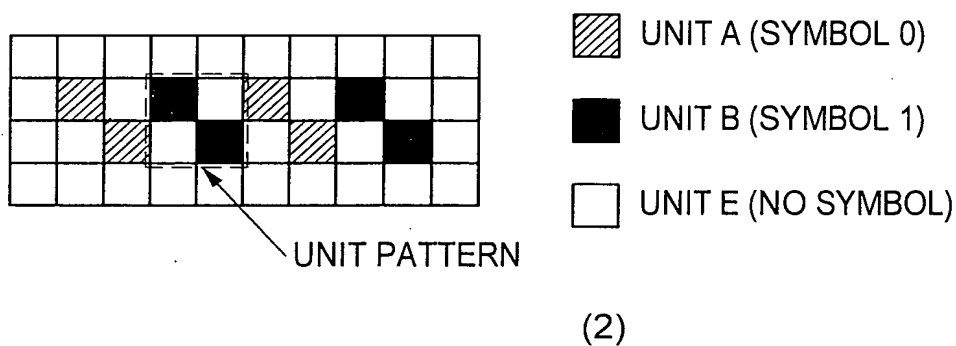
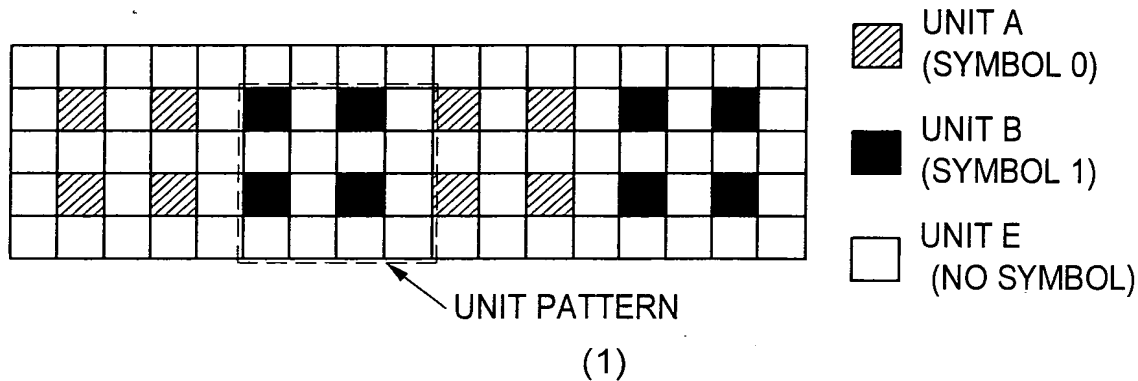


UNIT B

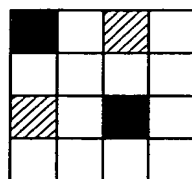
(3)

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FIG.7



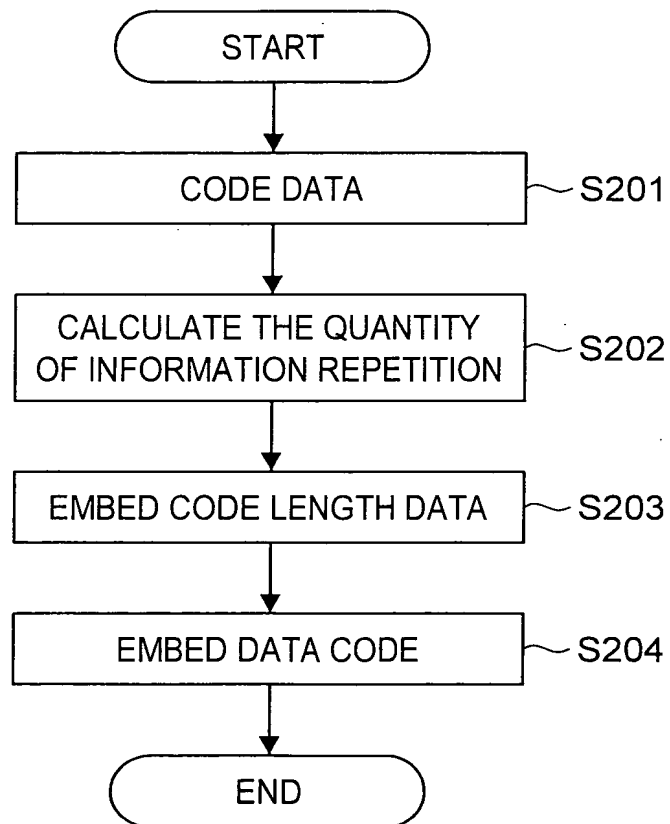
UNIT PATTERN
INDICATING SYMBOL 0



UNIT PATTERN
INDICATING SYMBOL 1

(3)

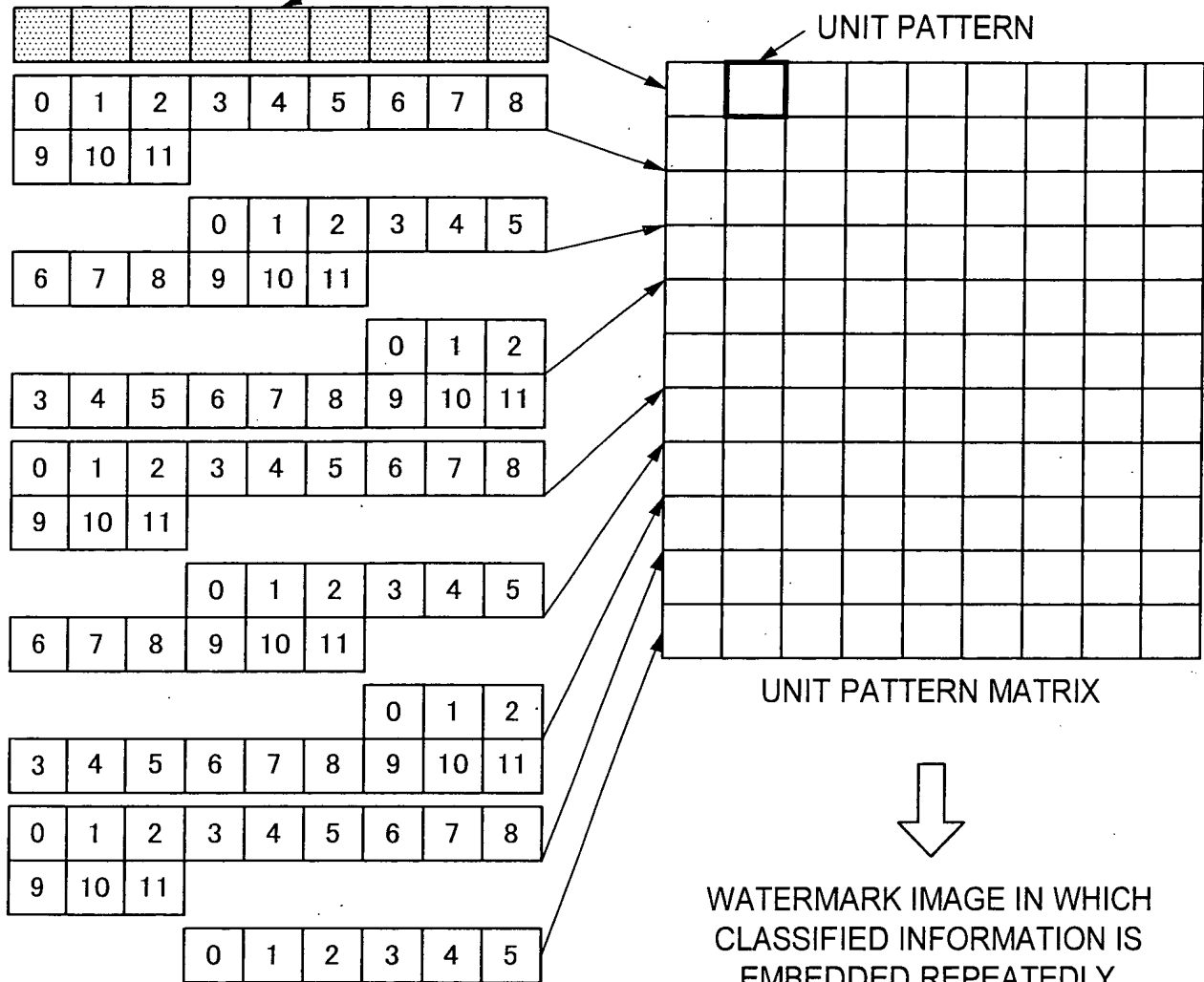
FIG.8



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FIG.9

UNIT PATTERN IN WHICH BIT STRING INDICATING CODE LENGTH IS EMBEDDED



INFORMATION REGION

0	1	2	3	4	5	6	7	8
9	10	11	0	1	2	3	4	5
6	7	8	9	10	11	0	1	2
3	4	5	6	7	8	9	10	11
0	1	2	3	4	5	6	7	8
9	10	11	0	1	2	3	4	5
6	7	8	9	10	11	0	1	2
3	4	5	6	7	8	9	10	11
0	1	2	3	4	5	6	7	8
9	10	11	0	1	2	3	4	5

FIG.10

SIGNAL UNIT COLOR	COLOR ON INPUT IMAGE	COLOR ON SYNTHESIZED IMAGE
FOREGROUND COLOR	FOREGROUND COLOR	FOREGROUND COLOR OF INPUT IMAGE
FOREGROUND COLOR	BACKGROUND COLOR	FOREGROUND COLOR OF SIGNAL UNIT
BACKGROUND COLOR	FOREGROUND COLOR	FOREGROUND COLOR OF INPUT IMAGE
BACKGROUND COLOR	BACKGROUND COLOR	BACKGROUND COLOR OF INPUT IMAGE

FIG.11

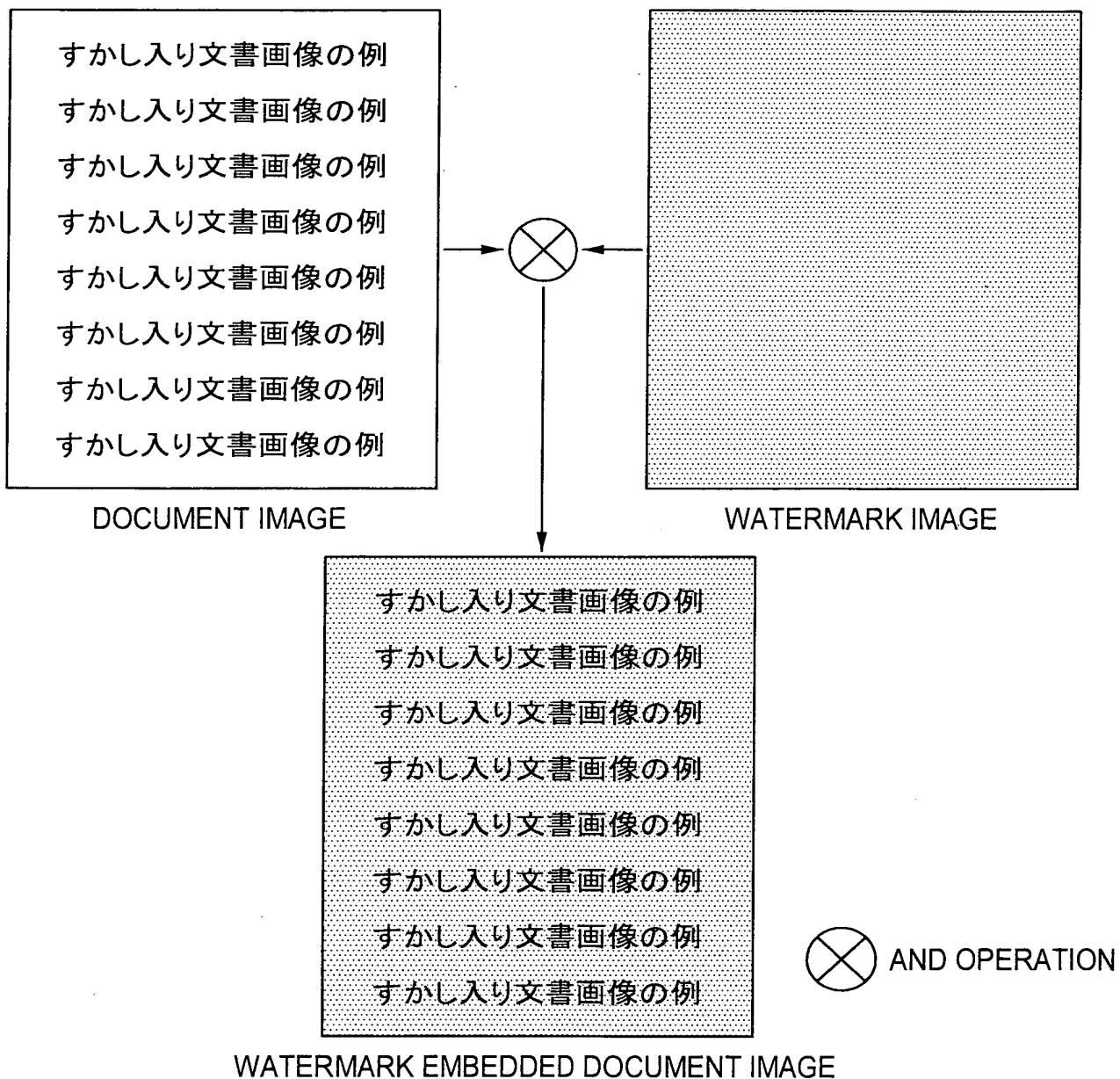


FIG.12

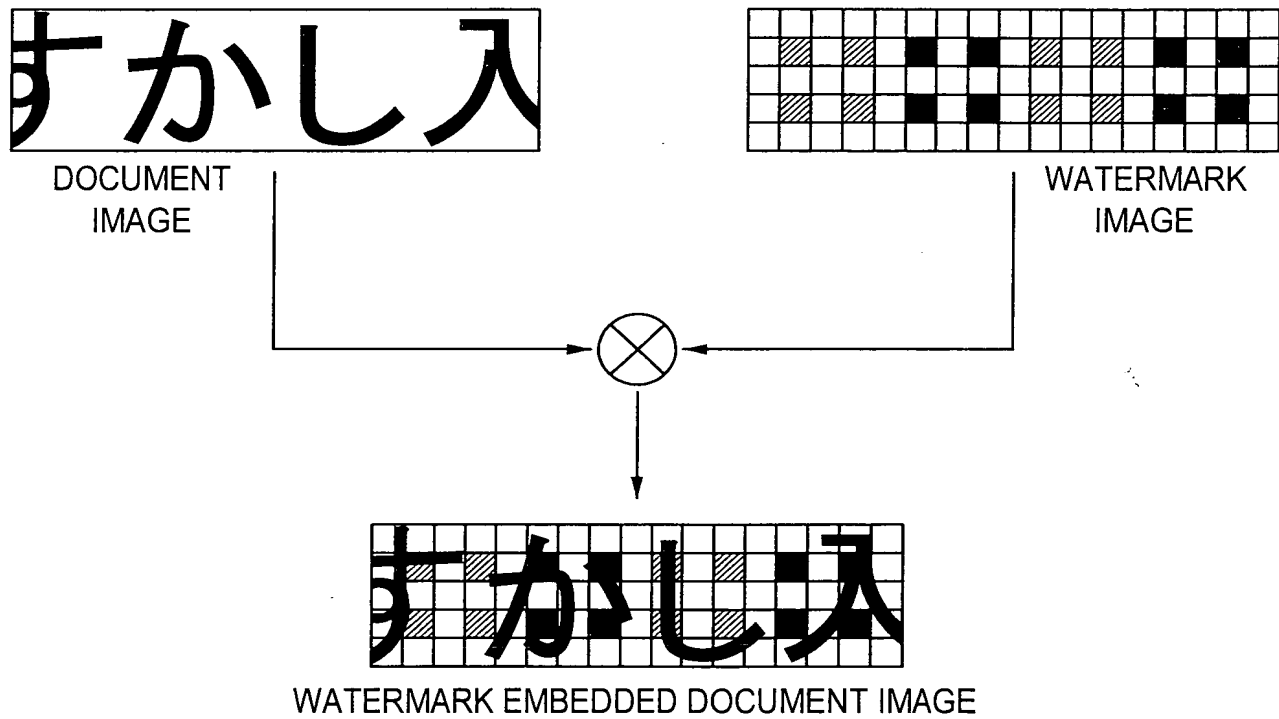
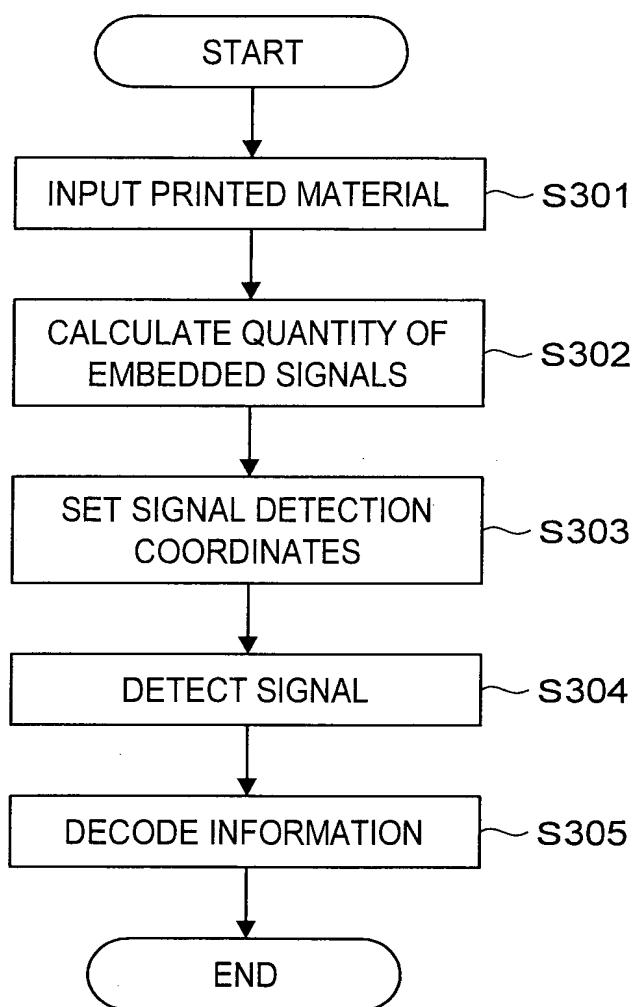


FIG.13



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FIG.14

すかし入り文書画像の例
すかし入り文書画像の例
すかし入り文書画像の例
すかし入り文書画像の例
すかし入り文書画像の例
すかし入り文書画像の例
すかし入り文書画像の例
すかし入り文書画像の例

INPUT IMAGE
(1)

UNIT PATTERN

AFTER SETTING COORDINATE
(2)

FIG.15

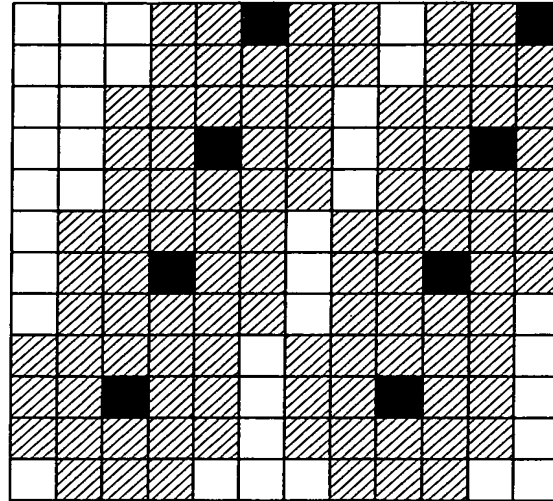
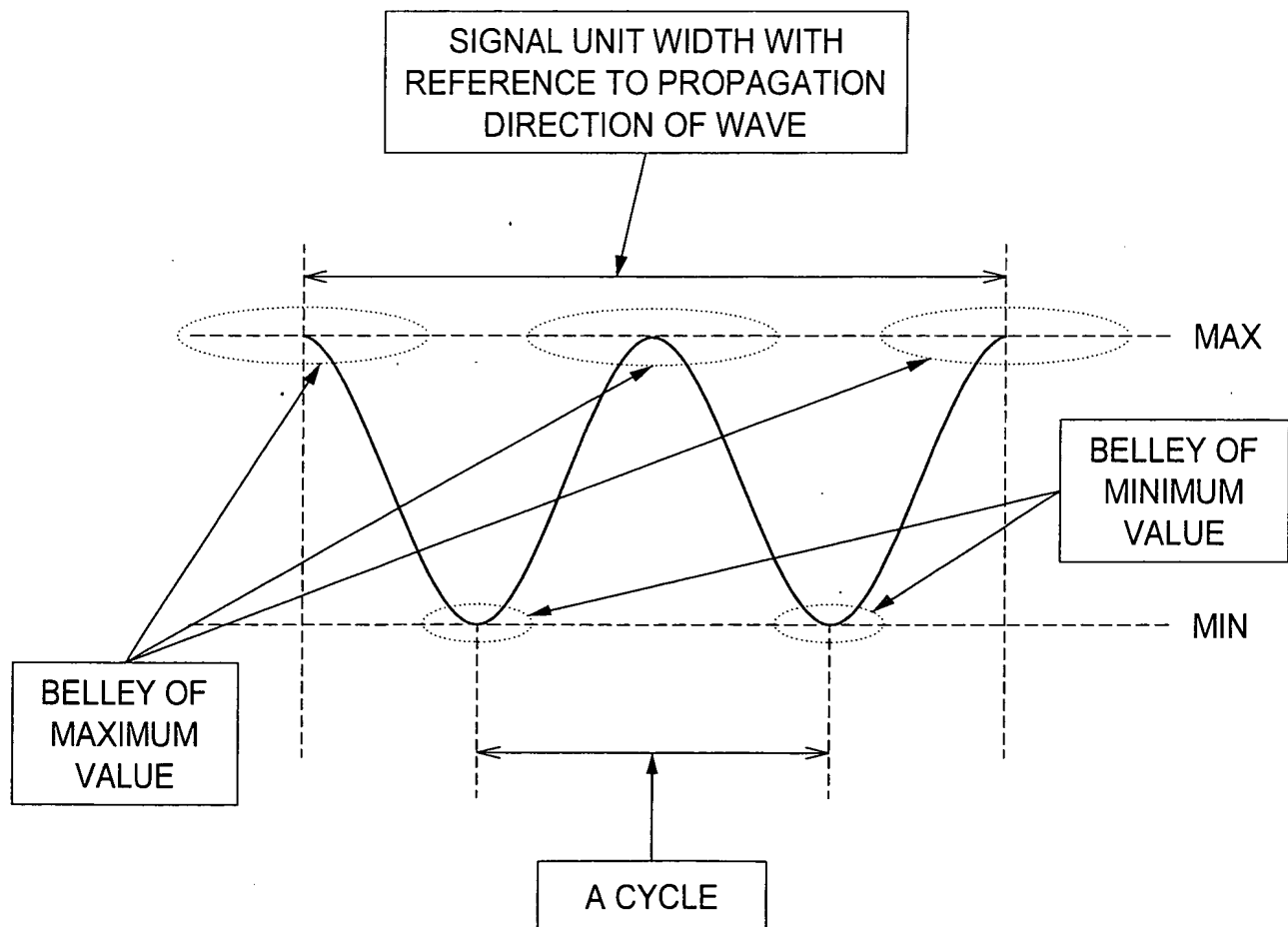
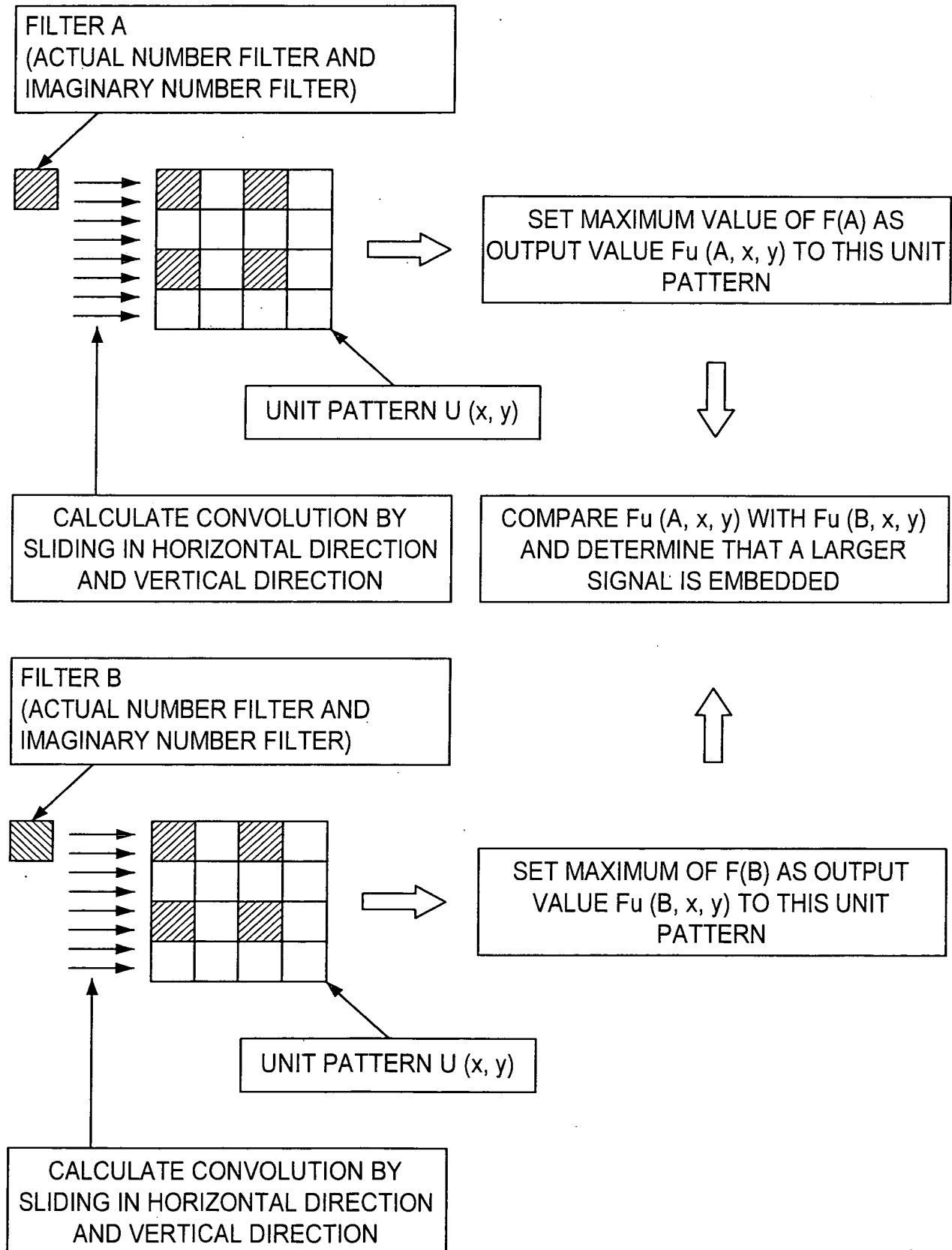


FIG.16



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FIG.17



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FIG.18

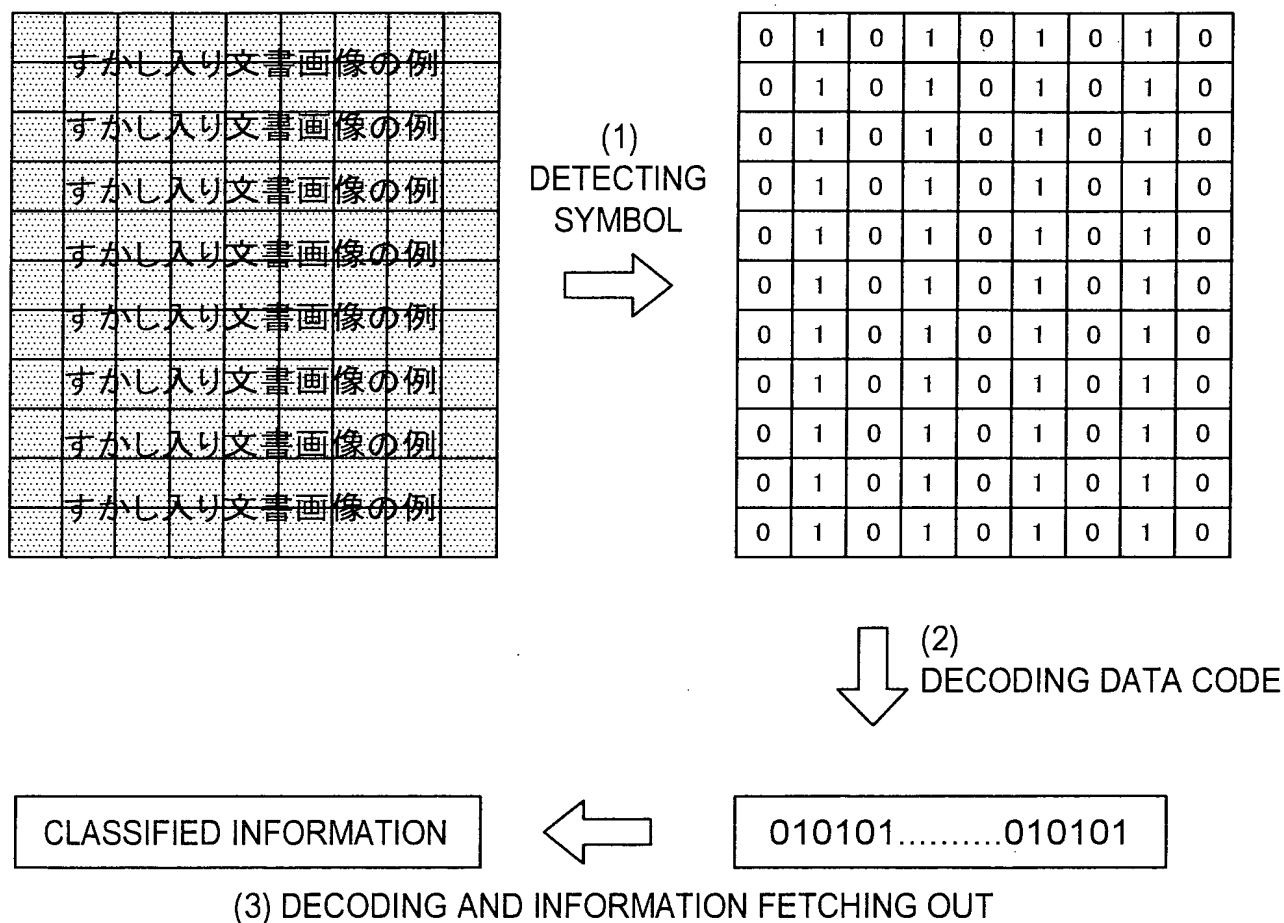


FIG.19

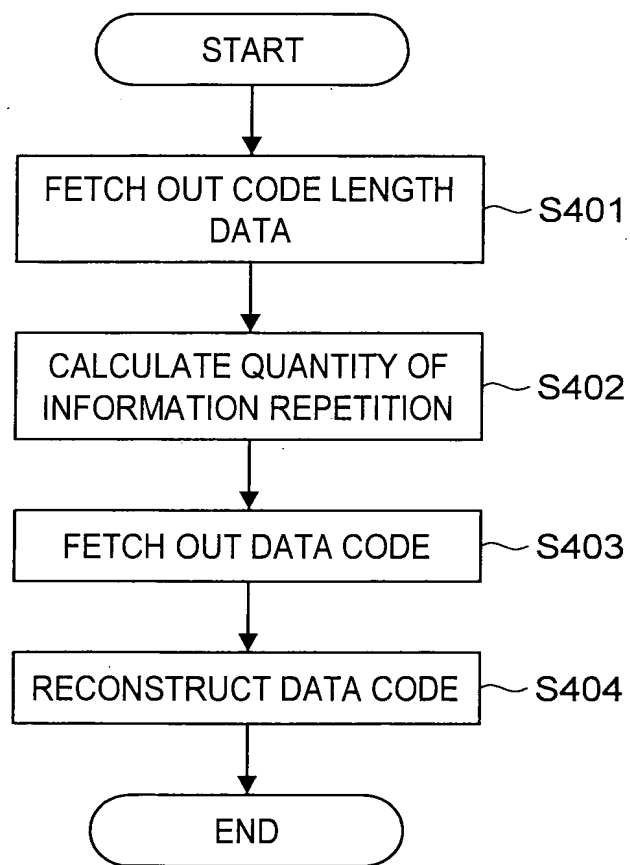
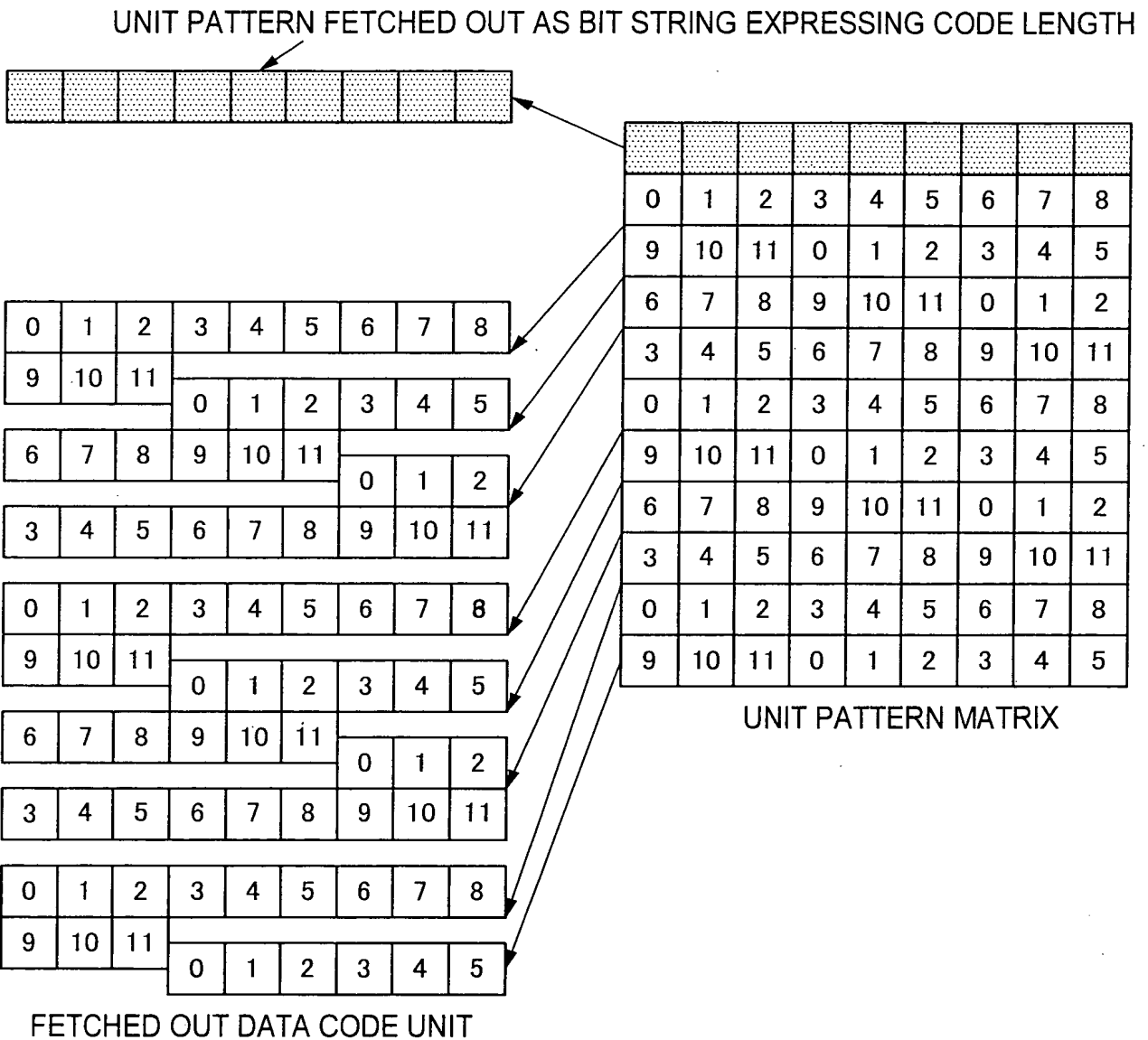
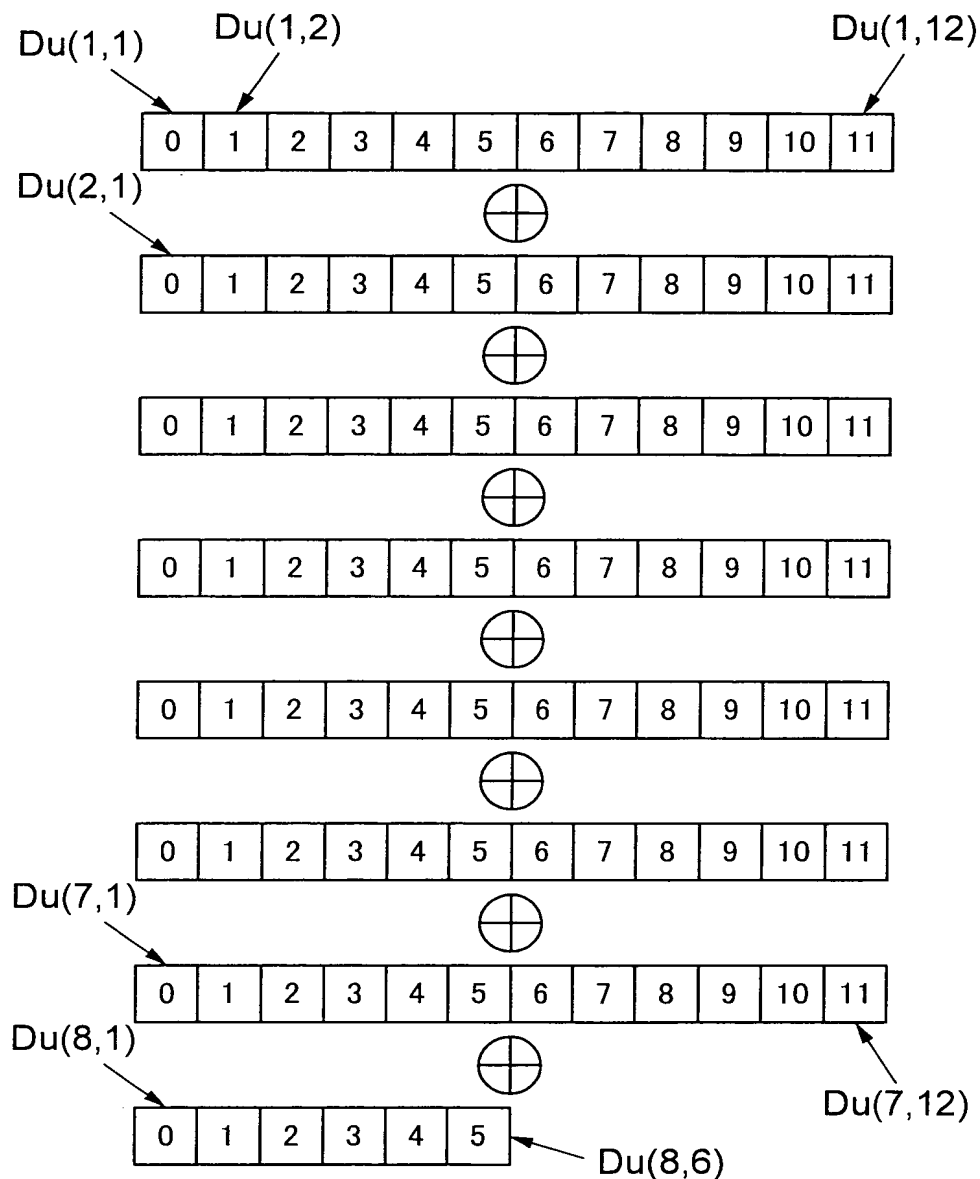


FIG.20

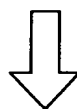


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FIG.21



\oplus BIT CERTAINTY FACTOR CALCULATION

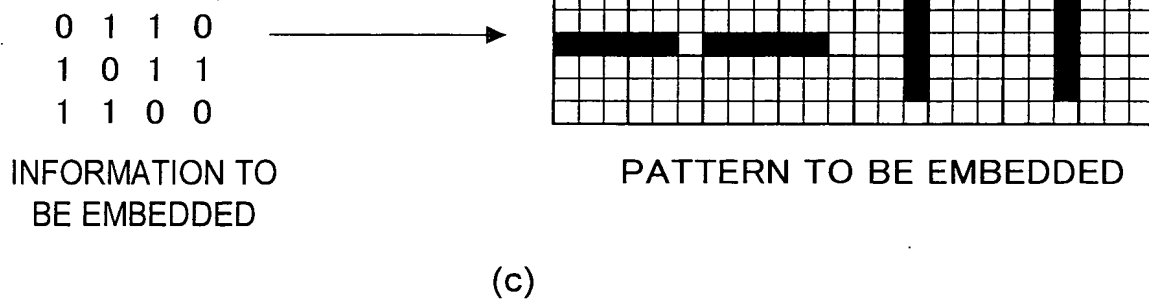
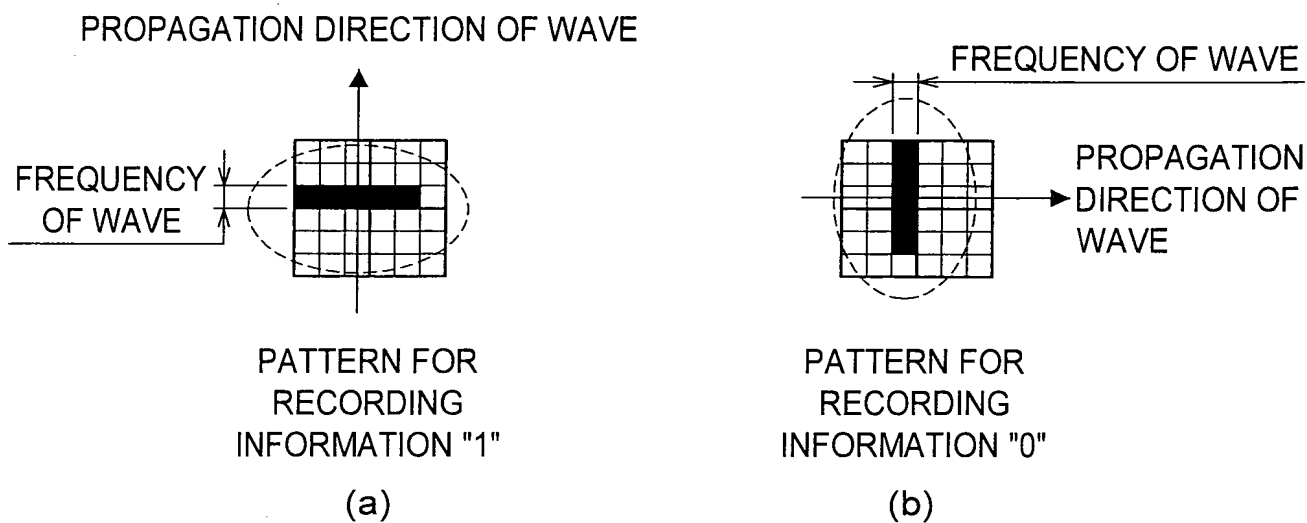


0	1	2	3	4	5	6	7	8	9	10	11
---	---	---	---	---	---	---	---	---	---	----	----

BIT STRING RECONSTRUCTED BY
 CERTAINTY FACTOR CALCULATION
 (DATA CODE)

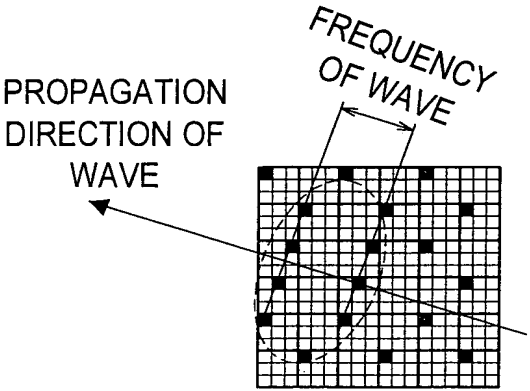
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FIG.22



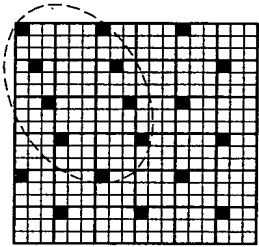
BEST AVAILABLE COPY

FIG.23



PATTERN FOR
RECORDING
INFORMATION "1"

(a)

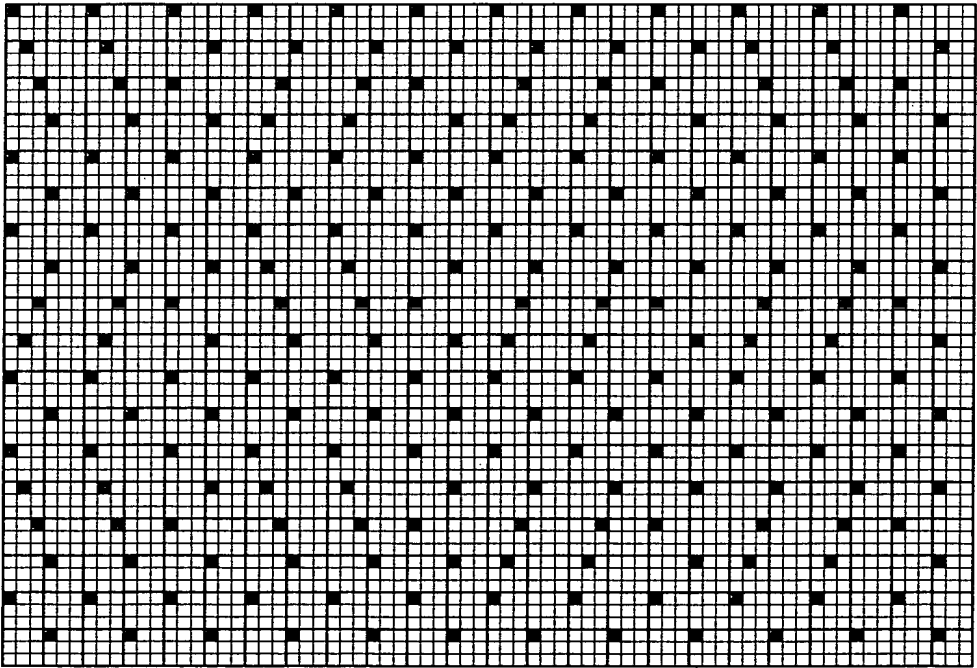


PATTERN FOR
RECORDING
INFORMATION "0"

(b)

0 1 1 0
1 0 1 1
1 1 0 0

INFORMATION
TO BE
EMBEDDED



PATTERN TO BE EMBEDDED

(c)

FIG.24

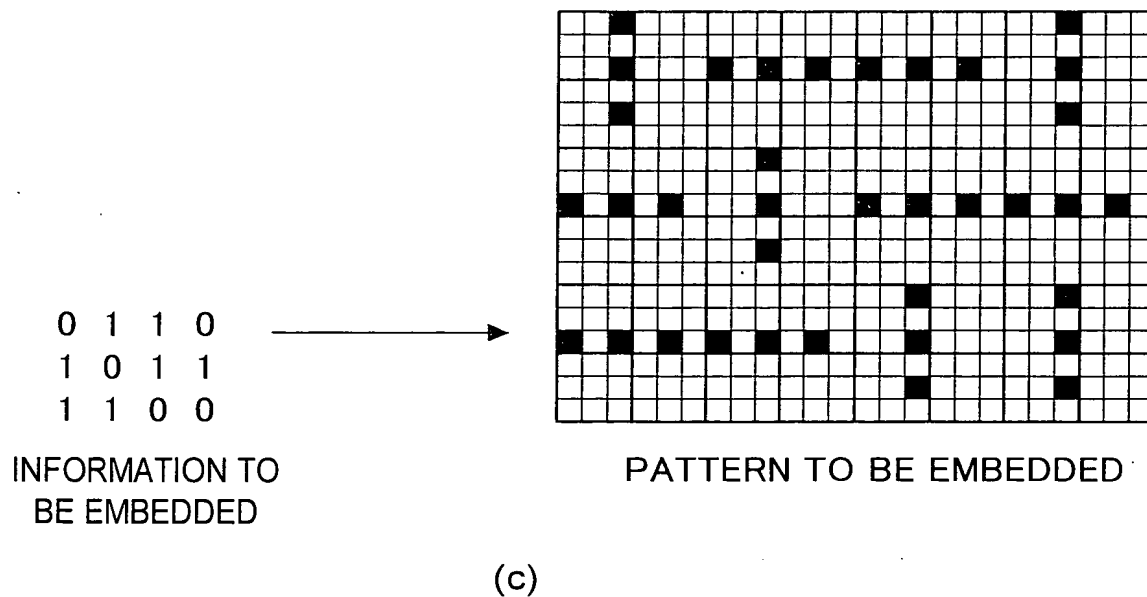
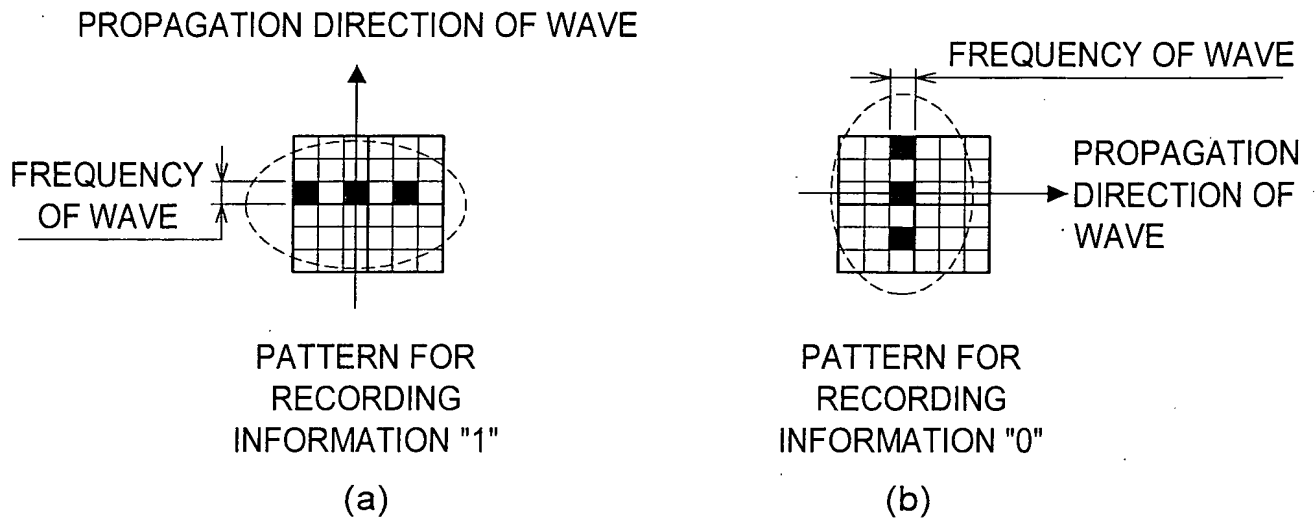


FIG.25

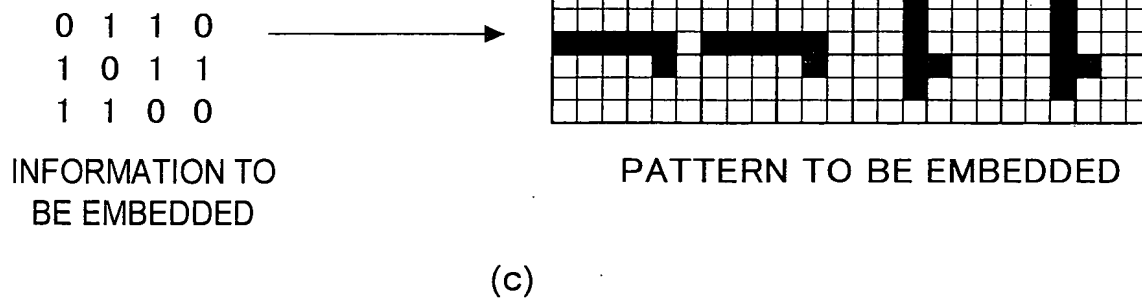
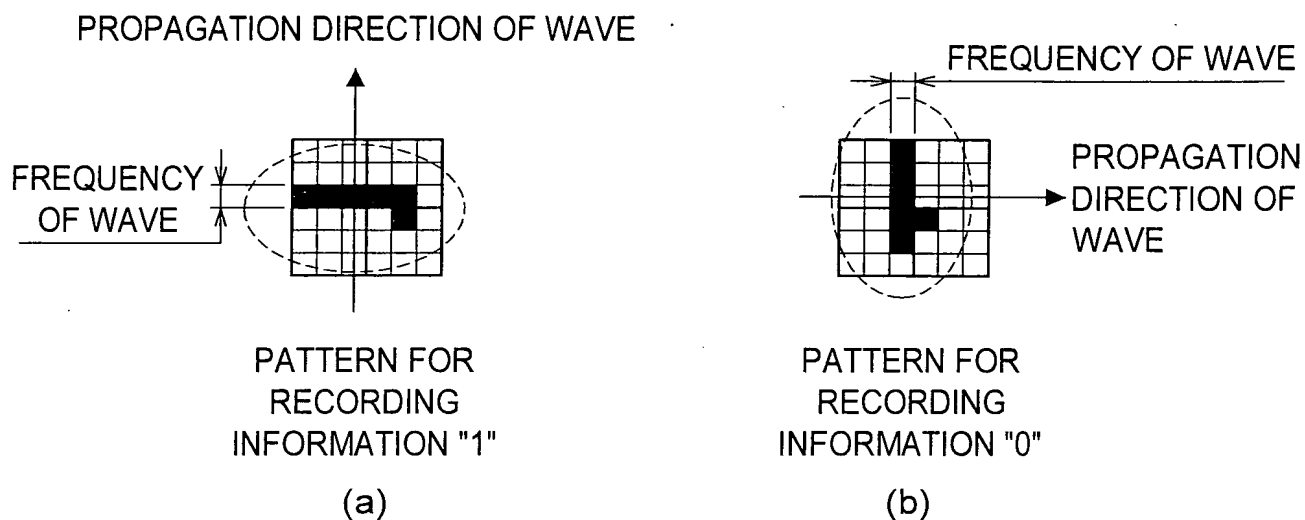
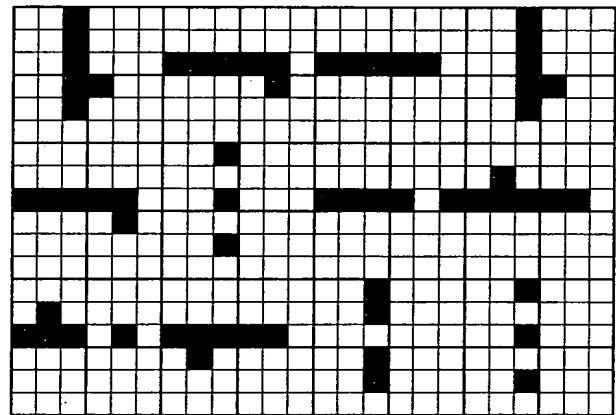


FIG.26

PATTERN CHANGE-OVER
INFORMATION
(OR RANDOM NUMBER)

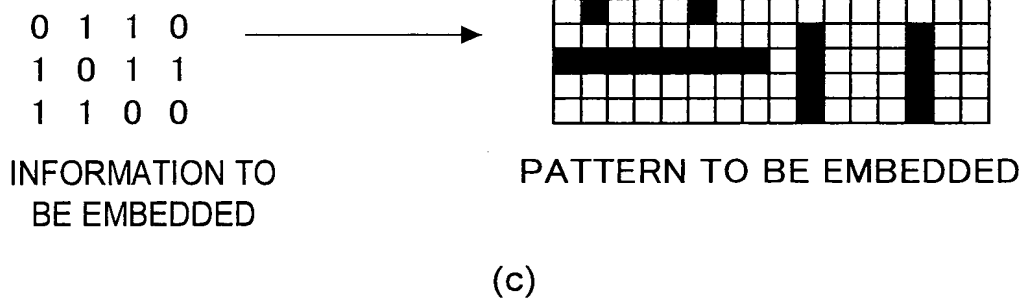
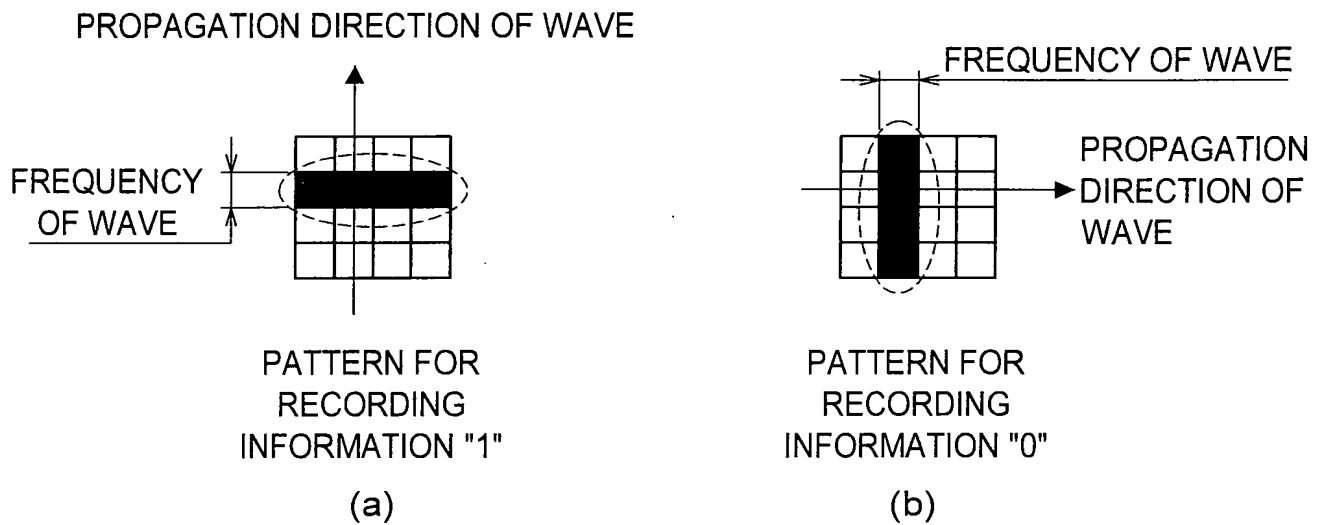
0 1 1 0
1 0 1 1
1 1 0 0

INFORMATION TO
BE EMBEDDED



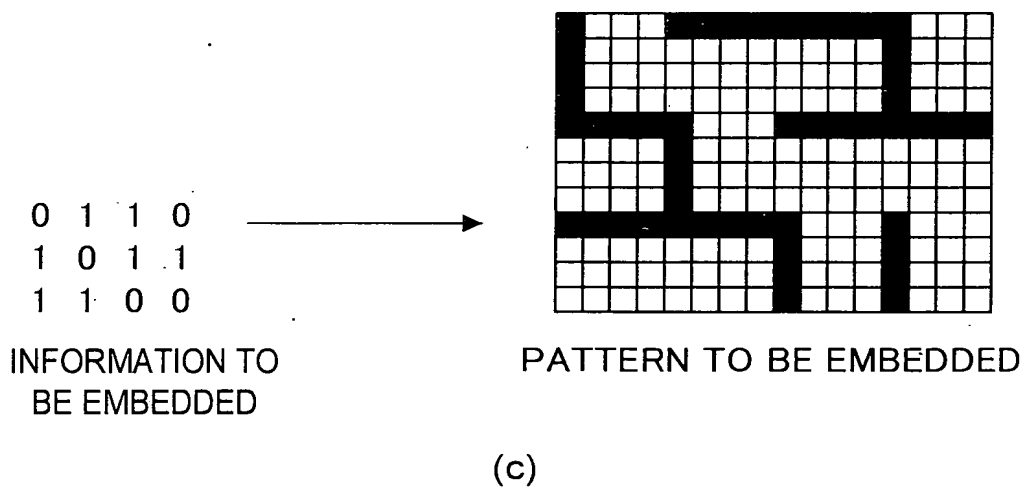
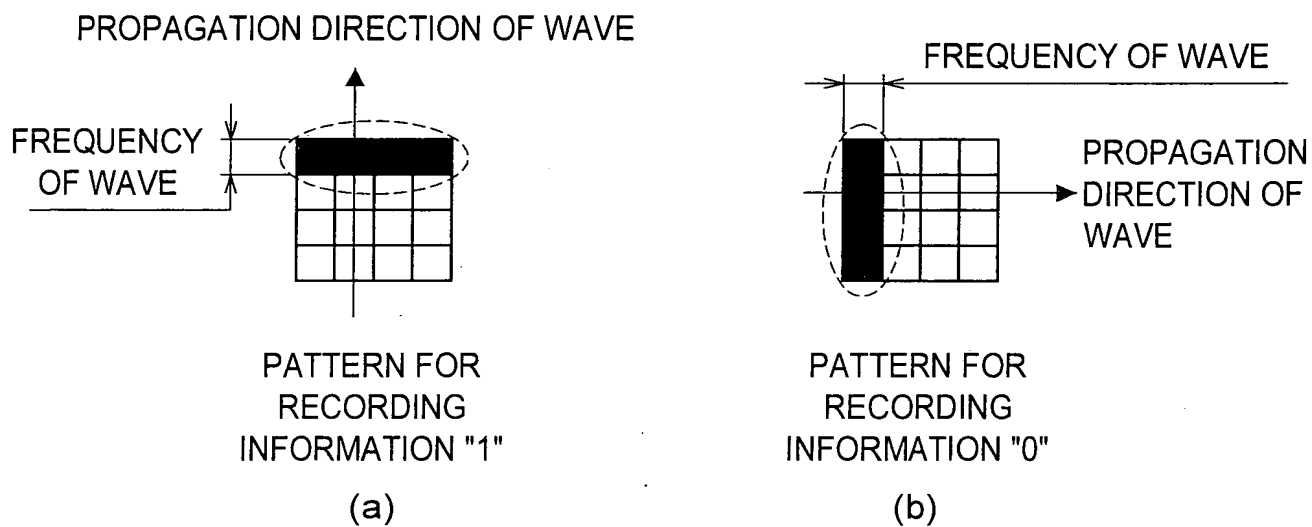
PATTERN TO BE EMBEDDED

FIG.27



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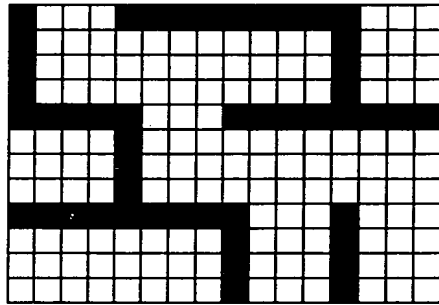
FIG.28



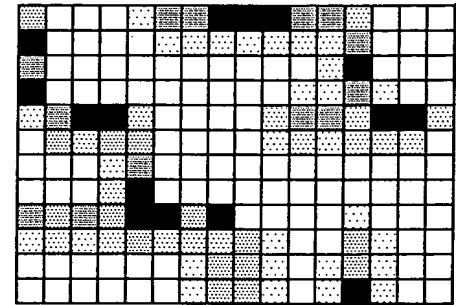
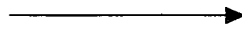
BEST AVAILABLE COPY

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FIG.29



PATTERN TO BE EMBEDDED



PATTERN OBTAINED BY
PRINTING/SCANNING

FIG.30

$P_{0,0}$	$P_{1,0}$	$P_{2,0}$	$P_{3,0}$
$P_{0,1}$	$P_{1,1}$	$P_{2,1}$	$P_{3,1}$
$P_{0,2}$	$P_{1,2}$	$P_{2,2}$	$P_{3,2}$
$P_{0,3}$	$P_{1,3}$	$P_{2,3}$	$P_{3,3}$

FILTER
PROCESSING MASK

(a)

$P_{0,0}$	$P_{1,0}$	$P_{2,0}$	$P_{3,0}$
$P_{0,1}$	$P_{1,1}$	$P_{2,1}$	$P_{3,1}$
$P_{0,2}$	$P_{1,2}$	$P_{2,2}$	$P_{3,2}$
$P_{0,3}$	$P_{1,3}$	$P_{2,3}$	$P_{3,3}$

PATTERN IN WHICH
FILTER OUTPUT IS
POSITIVE

(b)

$P_{0,0}$	$P_{1,0}$	$P_{2,0}$	$P_{3,0}$
$P_{0,1}$	$P_{1,1}$	$P_{2,1}$	$P_{3,1}$
$P_{0,2}$	$P_{1,2}$	$P_{2,2}$	$P_{3,2}$
$P_{0,3}$	$P_{1,3}$	$P_{2,3}$	$P_{3,3}$

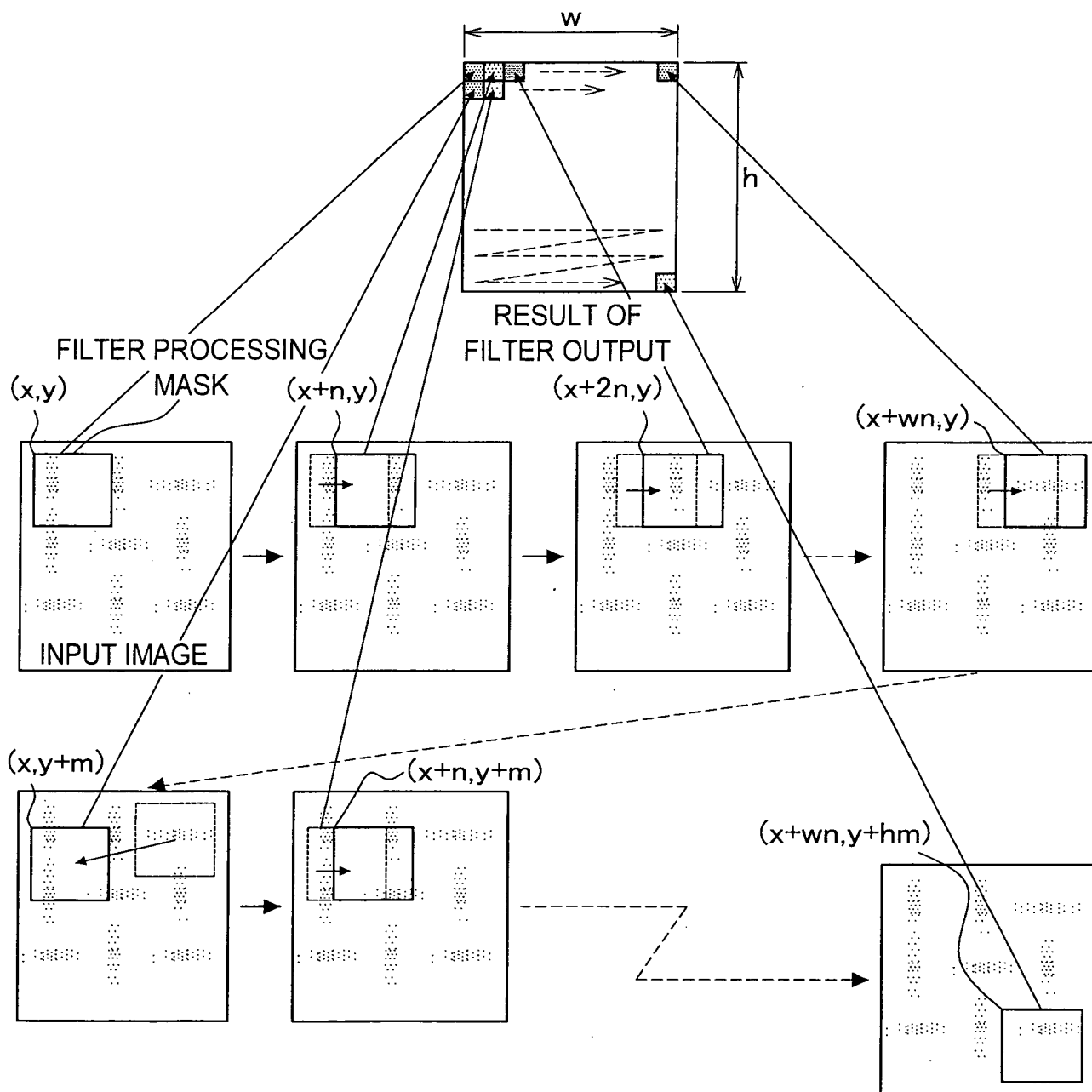
PATTERN IN WHICH
FILTER OUTPUT IS
NEGATIVE

(c)

BEST AVAILABLE COPY

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FIG.31



BEST AVAILABLE COPY

FIG.32

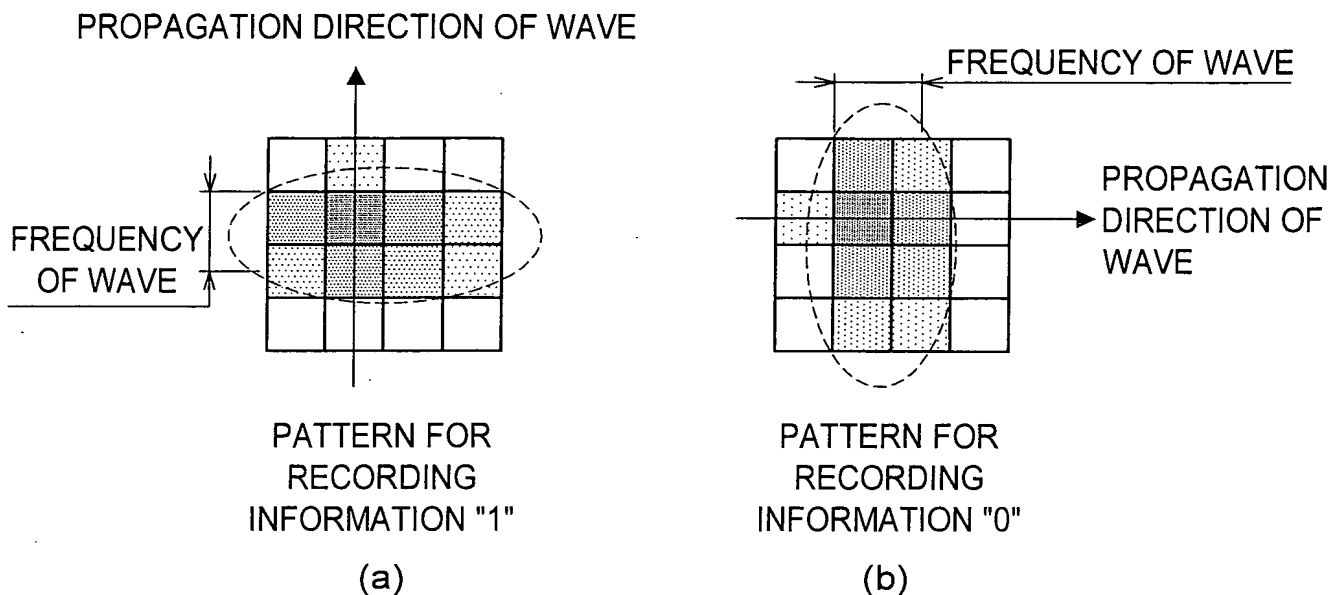
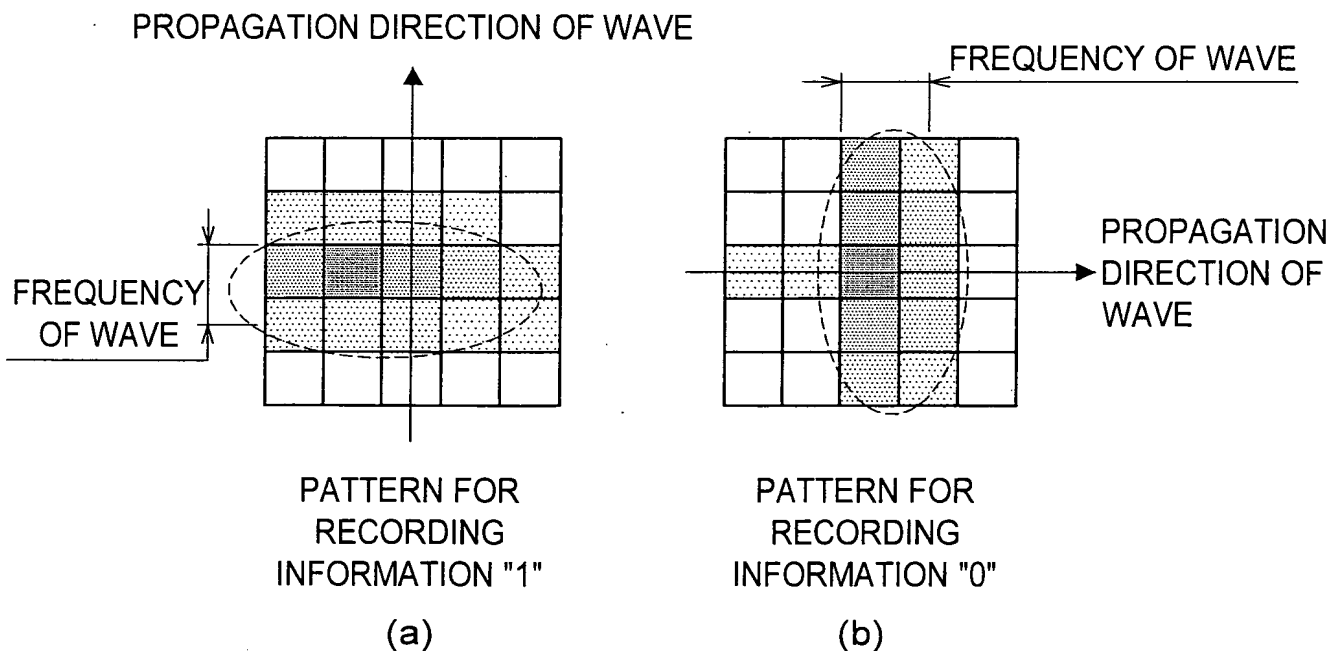


FIG.33



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FIG.34

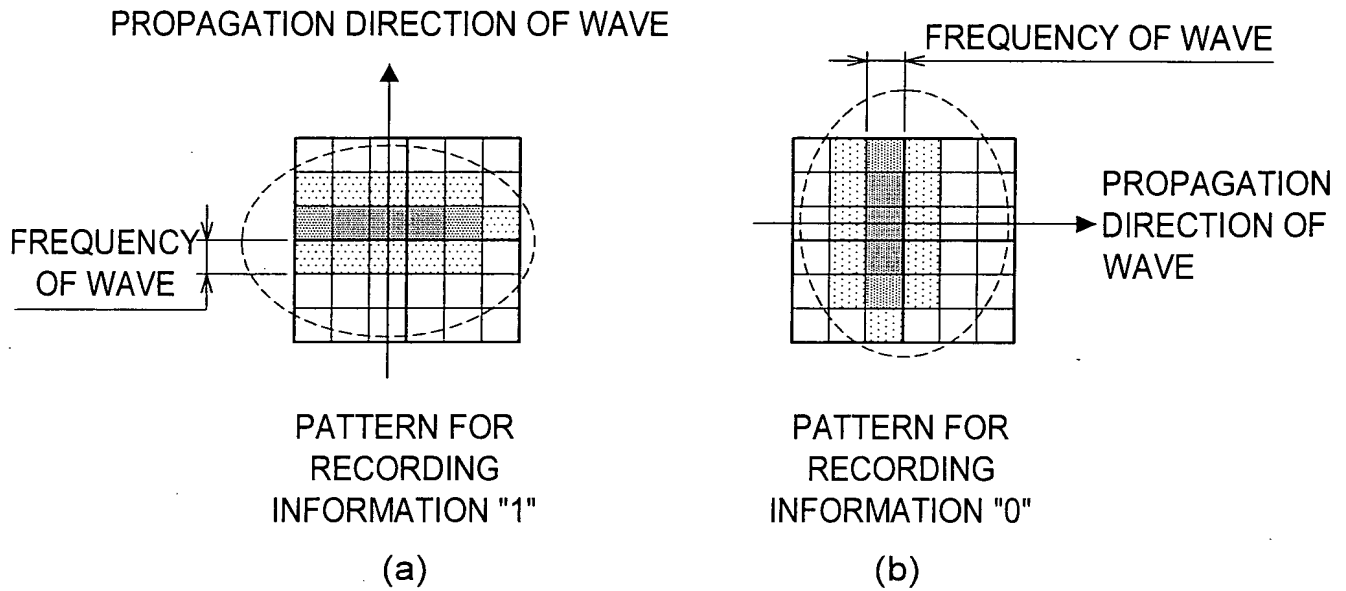
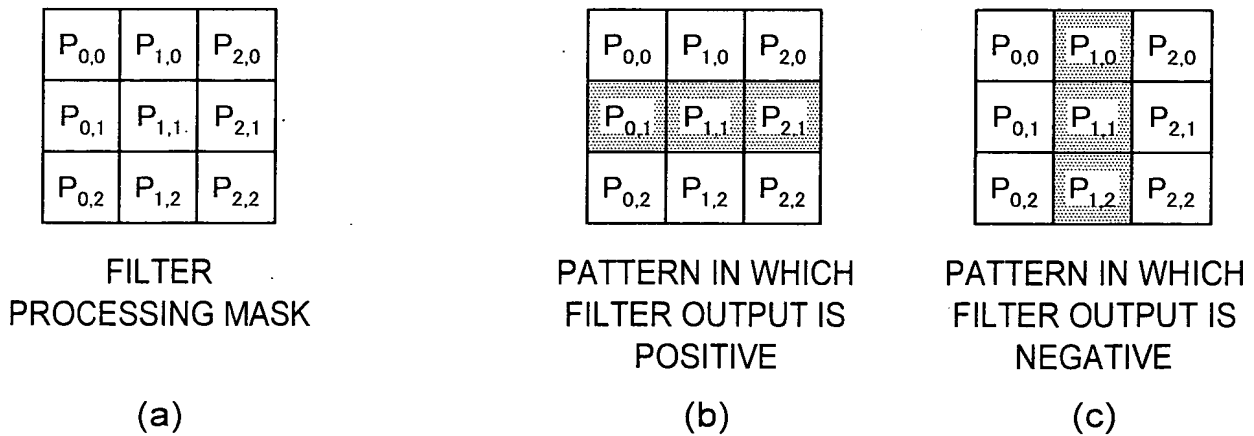


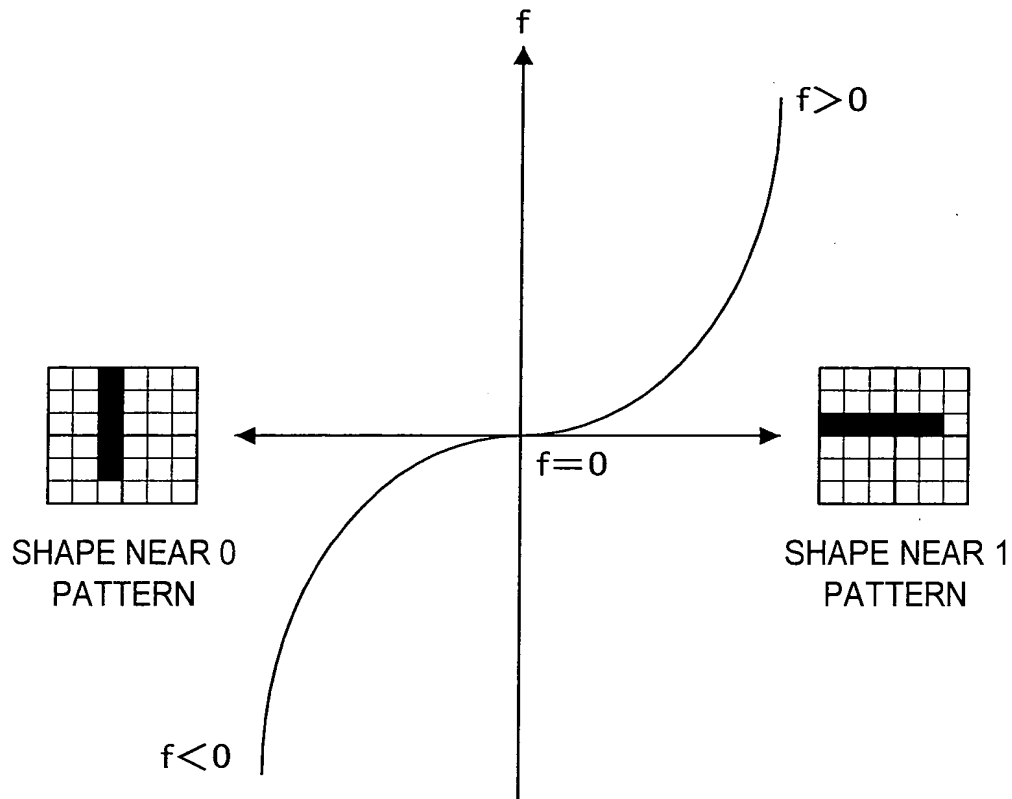
FIG.35



BEST AVAILABLE COPY

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FIG.36



BEST AVAILABLE COPY

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FIG.37

P _{0,0}	P _{1,0}	P _{2,0}	P _{3,0}	P _{4,0}	P _{5,0}
P _{0,1}	P _{1,1}	P _{2,1}	P _{3,1}	P _{4,1}	P _{5,1}
P _{0,2}	P _{1,2}	P _{2,2}	P _{3,2}	P _{4,2}	P _{5,2}
P _{0,3}	P _{1,3}	P _{2,3}	P _{3,3}	P _{4,3}	P _{5,3}
P _{0,4}	P _{1,4}	P _{2,4}	P _{3,4}	P _{4,4}	P _{5,4}
P _{0,5}	P _{1,5}	P _{2,5}	P _{3,5}	P _{4,5}	P _{5,5}

FILTER
PROCESSING MASK

(a)

PATTERN IN WHICH FILTER
PROCESSING RESULT IS
POSITIVE

(b)

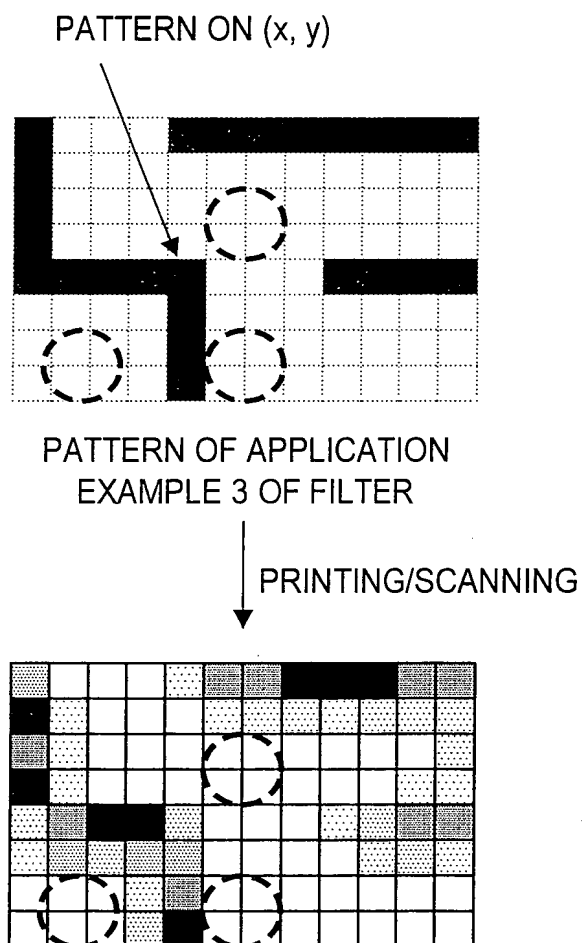
PATTERN IN WHICH FILTER
PROCESSING RESULT IS
NEGATIVE

(c)

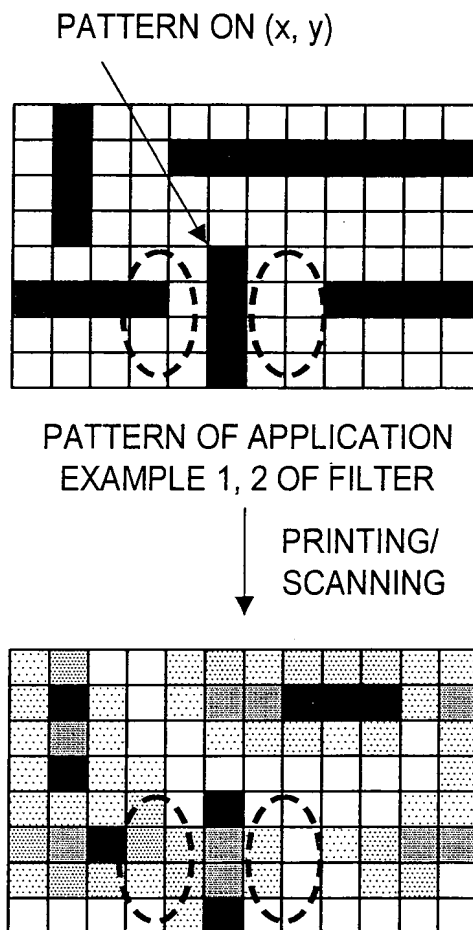


PORTION NOT INCLUDED IN FILTER PROCESSING OPERATION

FIG.38



(a)

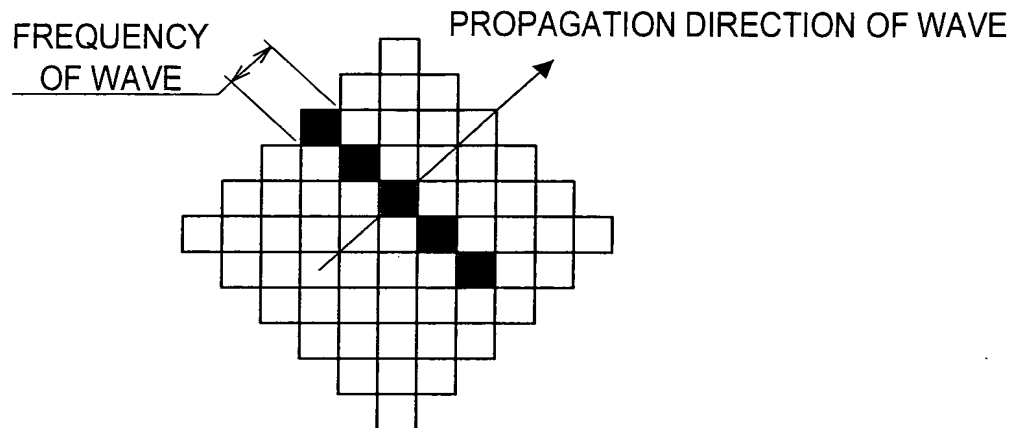


○ PORTION TO BE READ IN
BY FILTER PROCESSING

(b)

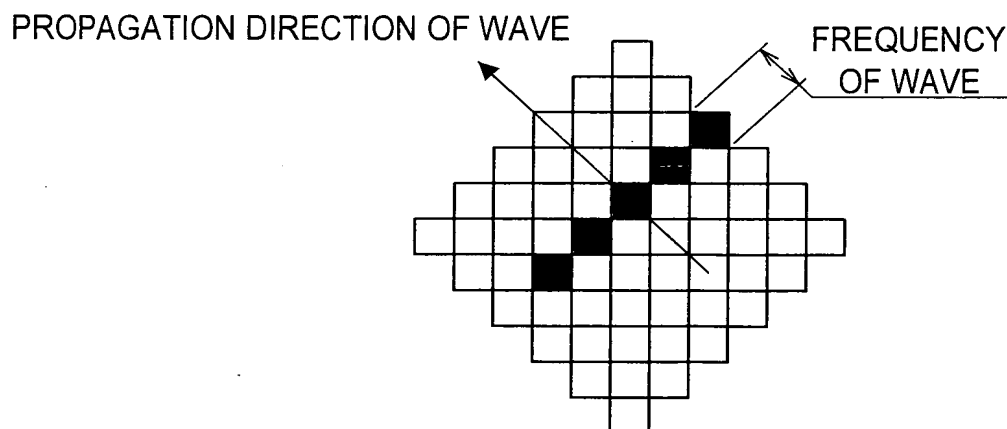
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FIG.39



PATTERN FOR
RECORDING
INFORMATION "1"

(a)



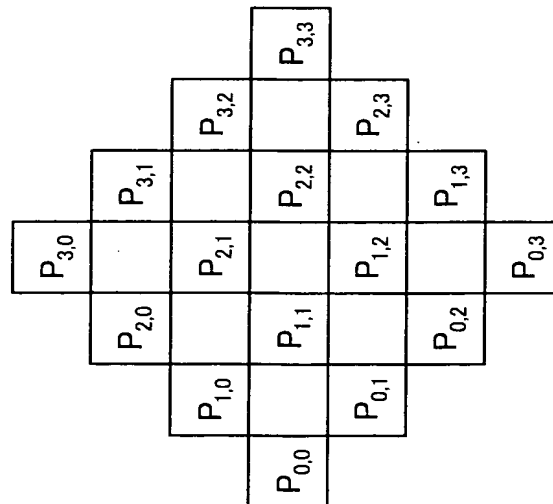
PATTERN FOR
RECORDING
INFORMATION "0"

(b)

BEST AVAILABLE COPY

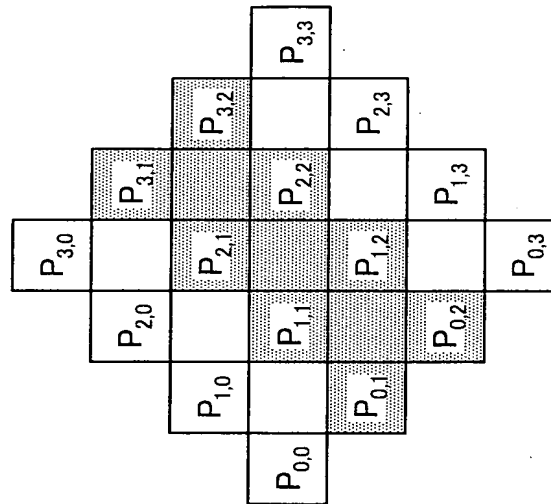
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FIG.40



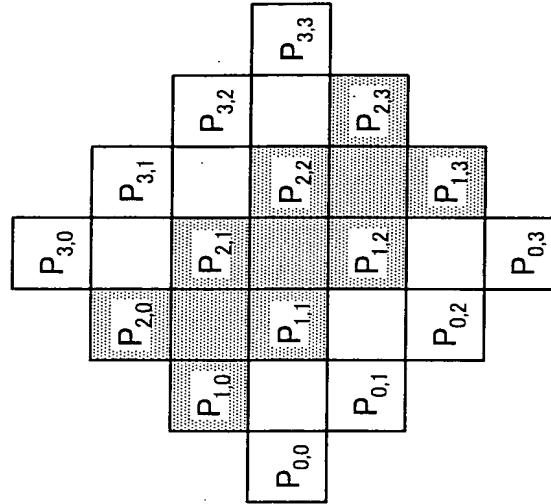
FILTER PROCESSING MASK
 (CASE OF SCANNING 600 dpi
 PRINTED MATERIAL AT 400 dpi)

(a)



PATTERN IN WHICH FILTER
 OUTPUT IS POSITIVE

(b)



PATTERN IN WHICH FILTER
 OUTPUT IS NEGATIVE

(c)